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TRANSACTIONS

OF THE

AMERICAN ASSOCIATION

OF

OBSTETRICIANS, GYNECOLOGISTS

AND

ABDOMINAL SURGEONS

VOL. XXXV

FOR THE YEAR 1922

Edited by James E. Davis, A.M., M.D.
Detroit

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BY THE

AMERICAN ASSOCIATION OF OBSTETRICIANS, GYNECOLOGISTS, AND ABDOMINAL SURGEONS

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NOTE

The Association does not hold itself responsible for the views enunciated in the papers and discussions published in this volume.

DR. JAMES E. DAVIS, *Secretary,*
111 JOSEPHINE AVENUE, DETROIT.

[Minutes and discussions stenographically reported by William Whitford, Chicago, Ill.]

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CONSTITUTION AND BY-LAWS

OF THE

AMERICAN ASSOCIATION

OF

OBSTETRICIANS, GYNECOLOGISTS,

AND

ABDOMINAL SURGEONS

TOGETHER WITH

MINUTES OF THE THIRTY-FIFTH ANNUAL MEETING

AMERICAN ASSOCIATION
OF
OBSTETRICIANS, GYNECOLOGISTS,
AND
ABDOMINAL SURGEONS

CONSTITUTION

I. The name of this Association shall be THE AMERICAN ASSOCIATION OF OBSTETRICIANS, GYNECOLOGISTS, AND ABDOMINAL SURGEONS.*

II. Its object shall be the cultivation and promotion of knowledge in whatever relates to Obstetrics, Gynecology, and Abdominal Surgery, except that which is peculiar to the male.

MEMBERS

III. The members of this Association shall consist of Ordinary Fellows, Honorary Fellows, Corresponding Fellows, and Senior Fellows.

The Ordinary Fellows shall not exceed one hundred and fifty in number.

The Honorary Fellows shall not exceed ten American and twenty-five foreign.

Candidates shall be proposed to the Executive Council at least three months before the first day of meeting, by two Fellows, and shall be balloted for at the annual meeting, a list of names having been sent to every Fellow with the notification of the meeting.

A two-thirds vote in the affirmative of all members present shall be necessary to elect—fifteen Fellows at least being in attendance.

All candidates for active fellowship shall submit to the Executive Council, at least three months before the annual meeting, an original paper relating to Obstetrics, Gynecology, or Abdominal Surgery, as indicated in Article II.

HONORARY FELLOWS

IV. The power of nominating Honorary Fellows shall be vested in the Executive Council.

Their election shall take place in the same manner as that of Ordinary Fellows.

They shall enjoy all the privileges of Ordinary Fellows, excepting to vote or hold office, but shall not be required to pay any fee.

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*At the Annual Session held in Atlantic City, September, 1920, the name of the Association was changed as above indicated.

CORRESPONDING FELLOWS

V. The Corresponding Fellows shall be recommended by the Executive Council and elected by the Association.

They shall enjoy all the privileges of Ordinary Fellows, excepting to vote or hold office, and shall be entitled to a copy of the annual TRANSACTIONS.

They shall pay an annual fee of five dollars.

SENIOR FELLOWS

Senior Fellows shall be nominated by the Executive Council, and elected by the Association as provided for in the election of Honorary Fellows, and they shall enjoy the same privileges as are accorded Corresponding Fellows.

OFFICERS

VI. The officers of this Association shall be a President, two Vice-Presidents, a Secretary, an Assistant Secretary, a Treasurer, and six Executive Councillors.

The nomination of all officers shall be made in open session at the business meeting, and the election shall be by ballot.

The first five officers shall enter upon their duties immediately before the adjournment of the meeting at which they shall be elected, and shall hold office for one year.

At the election next succeeding the adoption of these laws, the full number of Executive Councillors shall be elected; two for a term of three years, two for a term of two years, and two for a term of one year.

At every subsequent election two Councillors shall be elected for a term of three years, and shall continue in office until their successors shall have been elected and shall have qualified.

Any vacancy occurring during the recess may be filled temporarily by the Executive Council.

ANNUAL MEETINGS

VII. The time and place of holding the annual meeting shall be determined by the Association or may be committed to the Executive Council each time before adjournment.

It shall continue for three days, unless otherwise ordered by vote of the Association.

AMENDMENTS

VIII. This Constitution may be amended by a two-thirds vote of all the Fellows present at the annual meeting: *provided*, that notice of the proposed amendment shall have been given in writing at the annual meeting next preceding: and *provided further*, that such notice shall have been printed in the notification of the meeting at which the vote is to be taken.

AMERICAN ASSOCIATION

OF

OBSTETRICIANS, GYNECOLOGISTS,

AND

ABDOMINAL SURGEONS

BY-LAWS

THE PRESIDING OFFICER

I. The President, or in his absence, one of the Vice-Presidents shall preside at all meetings, and perform such other duties as ordinarily pertain to the Chair.

The presiding officer shall be *ex-officio* chairman of the Executive Council, but shall vote therein only in case of a tie.

SECRETARY

II. The Secretary shall attend and keep a record of all meetings of the Association and of the Executive Council, of which latter he shall be *ex-officio* clerk, and shall be entitled to vote therein.

He shall collect all moneys due from the members, and shall pay the same over to the Treasurer, taking his receipt therefor.

He shall supervise and conduct all correspondence of the Association; he shall superintend the publication of the TRANSACTIONS under the direction of the Executive Council, and shall perform all the ordinary duties of his office.

He shall be the custodian of the seal, books, and records of the Association.

ASSISTANT-SECRETARY

III. The Assistant-Secretary shall assist the Secretary, and shall assume the duties of the latter, should he, for any reason, become incapacitated.

TREASURER

IV. The Treasurer shall receive all moneys from the Secretary, pay all bills, and render an account thereof at the annual meetings, when an

Auditing Committee shall be appointed to examine his accounts and vouchers.

EXECUTIVE COUNCIL

V. The Executive Council shall meet as often as the interests of the Association may require. The President, or any three members may call a meeting, and a majority shall constitute a quorum.

It shall have the management of the affairs of the Association, subject to the action of the house at its annual meetings.

It shall have control of the publications of the Association, with full power to accept or reject papers or discussions.

It shall have control of the arrangements for the annual meetings, and shall determine the order of the reading of papers.

It shall constitute a court of inquiry for the investigation of all charges against members for offences involving law or honor; and it shall have the sole power of moving the expulsion of any Fellow.

ORDER OF BUSINESS

VI. The Order of Business at the annual meetings of the Association shall be as follows:

1. General meeting at 10 o'clock A.M.
   a. Reports of Committees on Scientific Questions.
   b. Reading of Papers and Discussion of the same.
2. One business Meeting shall be held at half-past nine o'clock A.M. on the first day of the session, and another on the evening of the second day (unless otherwise ordered by vote), at which only the Fellows of the Association shall be present. At these meetings the Secretary's record shall be read; the Treasurer's accounts submitted; the reports of Committees on other than scientific subjects offered; and all miscellaneous business transacted.

PAPERS

VII. The titles of all papers to be read at any annual meeting shall be furnished to the Secretary *not later* than one month before the first day of the meeting.

No paper shall be read before the Association that has already been published, or that has been read before any other body.

Not more than thirty minutes shall be occupied in reading any paper before the Association.

Abstracts of all papers read should be furnished to the Secretary at the meeting.

All papers read before the Association shall become its sole property if accepted for publication; and the Executive Council may decline to publish any paper not handed to the Secretary *complete* before the final adjournment of the annual meeting.

QUORUM

VIII. The Fellows present shall constitute a quorum for all business, excepting the admission of new Fellows or acting upon amendments to the Constitution, when not less than fifteen Fellows must be present.

DECORUM

IX. No remarks reflecting upon the personal or professional character of any Fellow shall be in order at any meeting, except when introduced by the Executive Council.

FINANCE

X. Each Fellow, on admission, shall pay an initiation fee of thirty dollars, which shall include his dues for the first year.

Every Fellow shall pay, *in advance* (*i.e.*, at the beginning of each fiscal year) the sum of twenty-five dollars annually thereafter.

[A fiscal year includes the period of time between the first day of the annual meeting and the first day of the next.]

Any Fellow neglecting to pay his annual dues for two years may forfeit his membership, upon the vote of the Executive Council.

The Secretary shall receive, annually, a draft from the President, drawn on the Treasurer, for a sum, to be fixed by the Executive Council, for the services he shall have rendered the Association during the year.

A contingent fund of one hundred dollars shall be placed annually at the disposal of the Secretary for current expenses, to be disbursed by him, and for which he shall present proper vouchers.

ATTENDANCE

XI. Any Fellow who shall neither attend nor present a paper for five consecutive years, unless he offers a satisfactory excuse, shall be dropped from fellowship, upon the vote of the Executive Council.

RULES

XII. *Robert's Rules of Order* shall be accepted as a parliamentary guide in the deliberations of the Association.

AMENDMENTS

XIII. These By-Laws may be amended by a two-thirds vote of the Fellows present at any meeting; *provided* previous notice in writing shall have been given at the annual meeting next preceding the one at which the vote is to be taken.

OFFICERS FOR 1922-1923

PRESIDENT

GORDON K. DICKINSON, Jersey City, N. J.

VICE-PRESIDENTS

G. V. BROWN, Detroit
J. A. HARRAR, New York City

SECRETARY

JAMES E. DAVIS, Detroit

TREASURER

W. G. DICE, Toledo, Ohio

EXECUTIVE COUNCIL

A. B. MILLER, Syracuse
E. A. WEISS, Pittsburgh
GEORGE W. CRILE, Cleveland
HENRY SCHWARZ, St. Louis
R. E. SKEEL, Los Angeles
H. E. HAYD, Buffalo

LIST OF OFFICERS

From the Organization to the Present

President	*Vice-Presidents*	*Secretary*	*Treasurer*
1888. Taylor, Wm. H.	Montgomery, E. E. Carstens, J. H.	Potter, Wm. W.	Werder, X. O.
1889. Montgomery, E. E.	Myers, W. H. Banta, R. L.	Potter, Wm. W.	Werder, X. O.
1890. Wright, A. H.	Rohé, G. H. Hall, R. B.	Potter, Wm. W.	Werder, X. O.
1891. Vander Veer, A.	Hill, H. E. Morris, R. T.	Potter, Wm. W.	Werder, X. O.
1892. McMurtry, L. S.	Ill, Ed. J. Longyear, H. W.	Potter, Wm. W.	Werder, X. O.
1893. Rohé, Geo. H.	Manton, W. P. Hulbert, Geo. F.	Potter, Wm. W.	Werder, X. O.
1894. Carstens, J. H.	Davis, W. E. B. Howitt, H.	Potter, Wm. W.	Werder, X. O.
1895. Price, Joseph	Cordier, Al. H. Peck, G. S.	Potter, Wm. W.	Werder, X. O.
1896. Ross, J. F. W.	Johnston, G. B. Sexton, J. C.	Potter, Wm. W.	Werder, X. O.
1897. Reed, C. A. L.	Douglas, R. Dorsett, W. B.	Potter, Wm. W.	Werder, X. O.
1898. Ill, Edward J.	Ricketts, Ed. Miller, A. B.	Potter, Wm. W.	Werder, X. O.
1899. Hall, R. B.	Dunning, L. H. Crofford, T. J.	Potter, Wm. W.	Werder, X. O.
1900. Davis, W. E. B.	Walker, Ed. Goldspohn, A.	Potter, Wm. W.	Werder, X. O.
1901. Ricketts, E.	Cumston, C. G. Porter, M. F.	Potter, Wm. W.	Werder, X. O.
1902. Dunning, L. H.	Rosenwasser, M. Hayd, H. E.	Potter, Wm. W.	Werder, X. O.
1903. Dorsett, W. B.	Miller, A. B. Haggard, W. D.	Potter, Wm. W.	Werder, X. O.
1904, Longyear, H. W.	Gilliam, D. T. Brown, J. Y.	Potter, Wm. W.	Werder, X. O.
1905. Brown, J. Y.	West, J. N. Simpson, F. F.	Potter, Wm. W.	Werder, X. O.
1906. Morris, R. T.	Crile, G. W. Bonifield, C. L.	Potter, Wm. W.	Werder, X. O.
1907. Zinke, E. G.	Keefe, J. W. Sellman, W. A. B.	Potter, Wm. W.	Werder, X. O.
1908. Humiston, Wm. H.	Sadlier, J. E. Davis, J. D. S.	Potter, Wm. W.	Werder, X. O.
1909. Miller, A. B.	Smith, C. N. Huggins, R. R.	Potter, Wm. W.	Werder, X. O.
1910. Hayd, H. E.	Schwarz, H. Morris, L. C.	Potter, Wm. W.	Werder, X. O.
1911. Werder, X. O.	Frank, L. Tate, M. A.	Zinke, E. G.	Hayd, H. E.
1912. Porter, M. F.	Smith, C. N. Sadlier, J. E.	Zinke, E. G.	Hayd, H. E.
1913. Smith, C. N.	Pantzer, H. O. Branham, J. H.	Zinke, E. G.	Hayd, H. E.
1914. Bonifield, C. L.	Davis, A. B. Sanes, K. I.	Zinke, E. G.	Hayd, H. E.
1915. Pantzer, H. O.	Dickinson, G. K. Pfaff, O. G.	Zinke, E. G.	Hayd, H. E.
1916. Keefe, J. W.	Ill, Chas. L. Pfaff, Orange G.	Zinke, E. G.	Hayd, H. E.
1917. Goldspohn, A.	Bainbridge, W. S. Jones, A. T.	Zinke, E. G.	Hayd, H. E.
1918. Erdmann, J. F.	Weiss, E. A. Yates, H. W.	Zinke, E. G.	Hayd, H. E.
1919. Crile, G. W.	Findley, P. Hadden, D.	Zinke, E. G.	Hayd, H. E.
1920. Schwarz, H.	McClellan, B. R. King. J. E.	Zinke, E. G.	Hayd, H. E.
1921. Skeel, R. E.	Vander Veer, E. A. Bill, A. H.	Zinke, E. G.	Hayd, H. E.
1922. Dickinson, G. K.	Brown, G. V. Harrar, J. A.	Davis, Jas. E.	Dice, W. G.

HONORARY FELLOWS

1899.—Ballantyne, John William, M.D., F.R.C.P.E., F.R.S. Edin. Lecturer on Midwifery and Gynecology, School of Medicine of the Royal Colleges, Surgeons' Hall, Edinburgh; Physician to the Royal Maternity Hospital, Edinburgh; formerly President of the Edinburgh Obstetrical Society; Examiner in Midwifery in the University of Edinburgh; Honorary Fellow of the Glasgow Obstetrical and Gynecological Society. 19 Rothesay Terrace, Edinburgh, Scotland.

1889.—Bantock, George Granville, MD., F.R.C.S. Ed. Surgeon to the Samaritan Free Hospital. Broad Meadow, King's Norton, Birmingham, England.

1889.—Barbour, A. H. Freeland, M.A., B.S.C., M.D., F.R.C.P. Ed., F.R.S. Ed. Lecturer on Midwifery and Diseases of Women in the Edinburgh Medical School; Assistant Physician to the Royal Maternity Hospital; Assistant Physician for Diseases of Women to the Royal Infirmary; Physician to the Women's Dispensary; Fellow of the Edinburgh and London Obstetrical Societies, and of the British Gynecological Society; Corresponding Fellow of the Royal Academy of Medicine, Turin. 4 Charlotte Square, Edinburgh, Scotland.

1889.—Croom, Sir J. Halliday, M.D., F.R.C.P.E., F.R.C.S.E., F.R.S.E. Professor of Midwifery in the University of Edinburgh; Consulting Physician to the Royal Infirmary; Physician to the Royal Maternity Hospital; late President of the Royal College of Surgeons, Edinburgh. 8 Morningside Place, Edinburgh, Scotland.

1891.—Fernandez Juan Santos, M.D. Prado, No. 105, Havana, Cuba.

1889.—Freund, William Alexander, M.D. Emeritus Professor and Director of the Clinic for Diseases of Women in the University of Strassburg. Kleiststrasse 9, Berlin W., Germany.

1912.—Gilliam, David Tod, M.D. Emeritus Professor of Gynecology, Starling-Ohio Medical College; Gynecologist to St. Anthony Hospital; Member of the American Medical Association, Ohio State Medical Association, Columbus Academy of Medicine; Honorary Member of the Northwestern Ohio Medical Association; Ex-president, Franklin County Medical Society; *Vice President,* 1905. 333 East State Street, Columbus, Ohio.

1921.—Humiston, William Henry, M.D. Clinical Professor of Gynecology in the Medical Department of Western Reserve University; Gynecologist in Chief to St. Vincent's Charity Hospital; Consulting Gynecologist to the City Hospital; President of the Ohio State Medical

Society, 1898. *Executive Council,* 1902-1903, 1908, 1910-1911. *President,* 1909. Residence, 2041 East Eighty-ninth Street; Office, 536 Rose Building, Cleveland, Ohio.

1894.—Jacobs, Charles, M.D., Professor of the Faculty of Medicine of Brussels; Secretary-General of the Permanent Committee of the Periodic International Congress of Gynecology and Obstetrics; Honorary President of the Belgian Society of Gynecology and Obstetrics; Honorary Fellow of the Gynecological Societies of New York and Chicago; Member of the Southern Surgical and Gynecological Association; Corresponding Member of the Gynecological Society of Paris, Surgeon to the Brussels Polyclinic. 157 Avenue Louise, Brussels, Belgium.

1890.—Martin, August, M.D., Emeritus Professor of Gynecology in the University of Greifswald. Geh. Med.-R. Berlin-Schöneberg, Freiherr vom Steinstr. 2, Untergundbhf. Stadtpark, Germany.

1897.—Mathews, Joseph McDowell, M.D. Professor of Diseases of the Rectum and Clinical Surgery, Hospital College of Medicine; President of the Kentucky State Board of Health; President American Medical Association, 1899; 404 Consolidated Realty Bldg., Los Angeles, Cal.

1910.—de Ott, Dimitrij Oskarovic. Professor of Obstetrics and Gynecology in the Royal Pavloona Clinical Institute of St. Petersburg; President of the Fifth International Congress of Obstetrics and Gynecology. Wassily Ostrow, University Place, Petrograd, Russia.

1891.—Pietranera, E., M.D. Professor of Obstetrics in the Medical Department of the National University; Director of the Maternity Branch of the Clinical Hospital. 2711 Calle Rio Adaria, Buenos Ayres, Argentine Republic, S. A.

1919.—Stanton, Byron, M.D. Consulting Obstetrician to Christ Hospital since 1888; Member of American Medical Association, American Public Health Association, Academy of Medicine of Cincinnati (Pres. 1903), Cincinnati Obstetrical Society (Pres. 1883); Member of Ohio State Board of Health, 1892 to 1909 (Pres. 1894, 1901, and 1908); Surgeon, 120th Ohio Voluntary Infantry, 1863-4; Surgeon, U. S. Vols., 1865; Superintendent, Ohio State Hospital, Cleveland, 1865-9. Residence, 6248 Savannah Avenue, Cincinnati, Ohio.

1888.—Williams, Sir John, Bart., M.D., F.R.C.P. Blaen Llynant, Aberystwyth, Cardiganshire, Wales.

Total, fifteen Honorary Fellows.

HONORARY FELLOWS, DECEASED

1892.—Boisliniere, L. Ch., A.B., M.D., LL.D.. Saint Louis, Mo., 1896.

1890.—Championniere, Just. Lucas, M.D., Paris, France, 1913.

1889.—Charpentier, Louis Arthur Alphonse, M.D., Paris, France, 1899.

1888.—Cordes, Auguste E., M.D., Geneva, Switzerland, 1914.

1890.—Corson, Hiram, M.D., Plymouth Meeting, Pa., 1896.

1889.—Dunlap, Alexander, A.M., M.D., Springfield, O., 1894.

1888.—Edis, Arthur Wellesley, M.D., Lond. F.R.C.S., M.R.S.C.S., London, England, 1893.

1889.—Eklund, Abraham Fredrik, M.D., Stockholm, Sweden, 1898.

1891.—Fisher, George Jackson, A.M., M.D., Sing Sing, N. Y., 1893.

1896.—Gaston, James McFadden, A.M., M.D., Atlanta, Ga., 1903.

1892.—Green, Traill, M.D., LL.D., Easton, Pa., 1897.

1889.—Keith, Thomas, M.D., London, England, 1896.

1889.—Leopold, G., M.D., Dresden, Germany, 1913.

1905.—McGraw, Theodore, A., M.D., Detroit, Mich., 1920.

1894.—Maclean, Donald, M.D., Detroit, Mich., 1903.

1895.—Mastin, Claudius Henry, M.D., LL.D., Mobile, Ala., 1898.

1891.—Moses, Gratz Ashe, M.D., Saint Louis, Mo., 1901.

1905.—Myers, William Herschel, M.D., Fort Wayne, Ind., 1907.

1889.—Nicolaysen, Julius, M.D., Christiania, Norway, 1915.

1889.—Saenger, Max, M.D., Prague, 1903.

1890.—Savage, Thomas, M.D., F.R.C.S. Eng., Birmingham, England, 1907.

1889.—Schultze-Jena, Bernhard Sigmund, M.D., Jena, Germany, 1919.

1890.—Segond, Paul, M.D., Paris, France, 1913.

1899.—Sinclair, Sir William Japp, A.M., M.D., Manchester, England, 1913.

1894.—Slaviansky, Kronid, M.D., St. Petersburg, Russia, 1898.

1888.—Smith, J. Greig, M.A., C.M., M.B., F.R.S.E., Bristol, England, 1897.

1896.—Sternberg, George Miller, A.M., M.D., LL.D., Washington, D. C., 1915.

1899.—Storrs, Melancthon, A.M., M.D., Hartford, Conn., 1900.

1888.—Tait, Lawson, M.D., LL.D., F.R.C.S.E., Birmingham, England, 1899.

1905.—Taylor, William Henry, M.D., *President*, 1888-1889, Cincinnati, Ohio, 1910.

1900.—Thornton, J. Knowsley, M.B., M.C., Cambridge, England, 1904.

1901.—Weber, Gustav C. E., M.D., LL.D., Willoughby, Ohio, 1912.

1889.—Von Winkel, F., M.D., Munich, Germany, 1912.

1905.—Wyman, Walter, M.D., Washington, D. C., 1911.

CORRESPONDING FELLOWS

1899.—Beuttner, Oscar, M.D. Professor of the Faculty of Medicine; Directeur de la Clinique gynécologique et obstétricale de l'Université de Geneve. Maison Royale, 46, Quai des Eaux-Vives, Geneva, Switzerland.

1914.—Das, Kedarnath, M.D. Professor of Midwifery and Gynecology, Campbell Medical School; Obstetrician and Gynecologist, Campbell Hospital, Calcutta; Examiner in Midwifery and Gynecology, Calcutta University; Examiner in Midwifery, College of Physicians and Surgeons, Bengal; Fellow, Royal Society of Medicine, London. 22 Bethune Row, Calcutta.

1903.—Ellis, Gutherne, M.D. Chief Surgeon to the Real Sociedade de Beneficencia Portuguese Hospital. 6 Rua Aurora, S. Paulo, Brazil, S. A.

1891.—Griffin, Herbert Spohn, B.A., M.B., M.D., C.M. Surgeon to St. Joseph's Hospital; Gynecologist to Hamilton City Hospital; 157 Main Street, Hamilton, Ontario, Canada.

1914.—Hertoghe, Eugene, M.D., Sc.D. 34 Chausse de Malines, Antwerp, Belgium.

1903.—Lane, Horace Manley, M.D., LL.D. President of Mackenzie College, S. Paulo, Brazil. 184 Rua da Consolacao, S. Paulo, Brazil, S. A.

1891.—Machell, Henry Thomas, M.D., L.R.C.P. Ed. Lecturer on Obstetrics, Women's Medical College; Surgeon to St. John's Hospital for Women; Physician to Victoria Hospital for Sick Children and to Hillcrest Convalescent Home. 95 Bellevue Avenue, Toronto, Ontario, Canada.

1898.—Wright, Adam Henry, B.A., M.D. Univ. Toronto, M.R.C.S., Eng. Professor of Obstetrics in the University of Toronto; Obstetrician and Gynecologist to the Toronto General Hospital and Burnside Lying-in Hospital, *President*, 1891. 30 Gerrard Street, East, Toronto, Ont., Canada.

Total, eight Corresponding Fellows.

SENIOR FELLOWS

1917.—Howitt, Henry, M.D., M.R.C.S., Eng. F.A.C.S. Senior Surgeon to the Guelph General and St. Joseph's Hospitals, Guelph. Member of the British, Canadian and Ontario Medical Associations. President of the Guelph Association. Vice-president, 1895. 221 Woolwich St., Guelph, Ontario, Canada.

1911.—Lincoln, Walter Rodman, B.A., M.D. Cocoa, Brevard County, Florida.

1919.—Lott, Henry Stokes, M.D. Member of Staff Attending Surgeons; Instructor of Nurses, Obstetrics and Gynecology, City Hospital. Residence, 810 West End Boulevard. Office, 308 Masonic Temple, Winston-Salem, North Carolina.

1917.—Sutcliffe, John Asbury, A.M., M.D., Capt., M.R.C., U. S. Army. Professor of Genito-urinary Surgery, Indiana University School of Medicine. Consulting Surgeon to St. Vincent's Infirmary; Consultant in Genito-urinary Diseases to the City Hospital and to the Protestant Deaconess' Hospital. Residence, 1121 Central Avenue; Office, 155 East Market Street, Indianapolis, Ind.

1921.—Westmoreland, Willis Foreman, M.D., F.A.C.S. Professor of Surgery at the Atlanta Medical College. Suite 241, Equitable Building, Atlanta, Ga.

ORDINARY FELLOWS

1920.—Babcock, William Wayne, A.M., M.D., F.A.C.S. Professor of Surgery, Temple University, Philadelphia; Surgeon, Samaritan, Garretson, and American Stomach Hospitals. Residence, Cloverly Lane, Rydal, Pa.; Office, 2033 Walnut St., Philadelphia, Pa.

1895.—Bacon, Joseph Barnes, M.D., F.A.C.S. Professor of Rectal Diseases at the Post-Graduate Medical School; Instructor in Clinical Surgery in the Medical Department of Northwestern University, Chicago; Surgeon in Chief St. Francis Hospital, Macomb, Ill.

1911.—Bainbridge, William Seaman, M.D., A.M., LL.D., M.S., C.M., Sc.D., Commander, M.C., U.S.N.R.F. (on active duty). Adjunct Professor, New York Post-Graduate Medical School, 1902-6; Professor New York Polyclinic Medical School and Hospital since 1906; Surgeon, New York Skin and Cancer Hospital; Attending Surgeon, New York City Children's Hospitals and Schools; Consulting Surgeon Manhattan State Hospital, Booth Memorial Hospital, Salvation Army Home and Hospital of New York City, College of Dental and Oral Surgery of New York, and Tarrytown Hospital, Tarrytown, N. Y.; Consulting Gynecologist, St. Andrew's Hospital (New York) and St. Mary's Hospital, Jamaica, Long Island and the Ossining Hospital, Ossining, N. Y.; Honorary President International Congress for Study of Tumors and Cancers, Heidelberg, Germany, 1906; Foreign Member of the Acadamie Royale de Medicine de Belgique; *Vice-president*, 1917-1918. Official delegate from the U. S. Navy to the Congrés International de Médecine et de Pharmacie Militaries, Bruxelles, 1921. Member of the Permanent Committee appointed by the above Congress. Officier legion d'Honneur. Officer Order of Leopold First, of Belgium. Fellow of the Royal Society of Medicine, London. 34 Gramercy Park, New York City.

1895.—Baldwin, James Fairchild, A.M., M.D., F.A.C.S. Memb. Volunteer M.C.; Surgeon to Grant Hospital, 125 South Grant Avenue. Residence, 405 E. Town Street, Columbus, Ohio.

1903.—Bandler, Samuel Wyllis, M.D., F.A.C.S. Instructor in Gynecology in the New York Post-Graduate Medical School and Hospital; Adjunct Gynecologist to the Beth Israel Hospital. Residence and Office, 134 West Eighty-seventh Street, New York, N. Y.

1911.—Barrett, Channing W., M.D., F.A.C.S. Professor of Gynecology and Head of Division of Gynecology, University of Illinois Med-

ical School, Gynecologist and head of Department of Gynecology, Cook County Hospital. 4245 North Ashland Ave., Chicago, Ill.

1913.—Baughman, Greer, M.D., F.A.C.S., Capt., M.C., U. S. Army, Honorably Discharged. Professor of Obstetrics, Medical College of Virginia; Visiting Obstetrician to the Stuart Circle Hospital, Virginia Hospital, and to the Memorial Hospital, Richmond, Virginia; Member of the Southern Surgical and Gynecological Association; Vice-president of the Medical Society of Virginia, 1905; President of the Richmond Academy of Medicine and Surgery, 1917; Member of the Tri-State Medical Association of Virginia and the Carolinas; Richmond Academy of Medicine and Surgery, Southern Medical Association and the American Medical Society. Residence and Office, 26 North Laurel St., Richmond, Virginia.

1907.—Bell, John Norval, M.D., F.A.C.S., Capt., M.C., U. S. Army. Associate Professor of Obstetrics, Detroit College of Medicine and Surgery; Attending Obstetrician, Providence Hospital; Consulting Obstetrician, Woman's Hospital, Booth Memorial Hospital, St. Mary's Hospital and Highland Park Hospital; Consulting Surgeon, Harper Hospital. Residence, 203 Pallister Avenue; Office, 1149 David Whitney Bldg., Detroit, Mich.

1914.—Bill, Arthur Holbrook, A.M., M.D., F.A.C.S. Associate Professor and Head of the Department of Obstetrics, School of Medicine, Western Reserve University; Obstetrician in Chief to the Maternity Hospital of Cleveland; Visiting Obstetrician and Department Head, Cleveland City Hospital; Director of the Out-Patient Obstetrical Department, Western Reserve University; Consulting Obstetrician to the Elyria Memorial Hospital, Elyria, Ohio, and The Community Hospital, Berea, Ohio. Residence, 1804 East Ninety-third Street; Office, 503 Osborn Building, Cleveland, Ohio.

1900.—Bonifield, Charles Lybrand, M.D. Professor of Gynecology, Medical Department of the University of Cincinnati. Member and Ex-President, Cincinnati Academy of Medicine, Cincinnati Obstetrical Society, Ohio State Medical Association and Ohio Clinical Association. Member of American Medical Association, Southern Surgical and Gynecological Society. *President*, 1914. Residence, 1763 East McMillan Street; Office, 409 Broadway, Cincinnati, Ohio.

Founder.—Boyd, James Peter, A.M., M.D. Emeritus Professor of Obstetrics and Diseases of Children in the Albany Medical College; Consulting Obstetrician to the Albany Hospital; Fellow of the British Gynecological Society; Fellow of the Royal Society of Medicine. 152 Washington Avenue, Albany, N. Y.

1889.—Branham, Joseph H., M.D. Professor of Surgery in the Maryland Medical College; Surgeon to the Franklin Square Hospital. 2200 Eutaw Place, corner Ninth Avenue, Baltimore, Md.

1912.—Brown, George Van Amber, M.D. Gynecologist to Providence Hospital; Urologist to Highland Park General Hospital; Member Wayne Co. and Michigan State Med. Soc.; Member American Medical Association; President Northern Tri-State Med, Soc. 1918. *Vice-president,* 1923. Residence, 2672 Taylor Ave.; Office, 13300 Woodward Avenue, Detroit, Mich.

1914.—Brown, William Mortimer, M.D., F.A.C.S. Obstetrician to Rochester General Hospital. Residence and Office, 1776 East Ave., Rochester, N. Y.

1918.—Burckhardt, Louis, M.D. Professor of Obstetrics, Indiana University. Residence, 3159 North Pennsylvania Street; Office, 621 Hume-Mansur Building, Indianapolis, Ind.

1908.—Buteau, Samuel H., M.D., F.A.C.S. Former member of California State Board of Medical Examiners; formerly Visiting Surgeon to Almeda County Hospital. Residence, 1052 Telegraph Avenue; Office 1155 Broadway, Oakland, Cal.

1914.—Chandler, George Fletcher, M.D., F.A.C.S., Maj., M.C., U. S. Army. Surgeon to the Kingston City Hospital. Residence and Office, 11 East Chestnut St., Kingston, N. Y.

1915.—Clark, Edmund Dougan, M.D., F.A.C.S., Lt. Col. M.C., U. S. A., Commander of Base Hospital No. 32, A. E. F. Professor of Surgery and Secretary of the Faculty, Indiana University School of Medicine; Consulting Surgeon, Indianapolis City Hospital; Visiting Surgeon, Methodist Hospital. Residence, 1321 N. Meridian St.; Office, Hume-Mansur Bldg., Indianapolis, Ind.

1920.—Condit, William Henry, M.D., B.S., F.A.C.S. Asst. Professor of Obstetrics and Gynecology, University of Minnesota. Residence, 2205 Kenwood Place; Office, The Nicollect Clinic, 1009 Nicollect Ave., Minneapolis, Minn.

1901.—Crile, George W., A.M., M.D., F.A.C.S., Col. M.C., U. S. Army. Senior Consultant in Surgical Research, American Expeditionary Forces; Professor of Surgery, Western Reserve Medical College; Visiting Surgeon to Lakeside Hospital. *Vice-president,* 1907; *President,* 1920. Residence, 2620 Derbyshire Road, Cleveland Heights; Office, Cleveland Clinic, Euclid at East Ninety-third Street, Cleveland, Ohio.

1905.—Crossen, Harry Sturgeon, M.D., F.A.C.S. Clinical Professor of Gynecology in Washington University; Gynecologist to Washington University Hospital; Associate Gynecologist to Mullanphy Hospital; Consulting Gynecologist to Bethesda, City and Female Hospitals. Residence, 4477 Delmar Avenue; Office, 310 Metropolitan Building, Saint Louis, Mo.

1912.—Crotti, André, M.D., F.A.C.S. Capt., M.C., U. S. Army. Professor of Clinical Surgery, Ohio State University; Surgeon to Grant Hospital, Children's Hospital and to St. Francis Hospital. Residence, 1728 E. Broad Street; Office, 151 E. Broad Street, Columbus, Ohio.

1912.—Darnall, William Edgar, A.B., M.D., F.A.C.S. Gynecologist, Atlantic City Hospital; Consulting Surgeon to North American Children's Sanitarium for the Treatment of Surgical Tuberculosis, and Home for Incurables, Longport, New Jersey; Surgeon to the Max and Sarah Bamburger Home, Longport; *Vice-president* American Medical Association, 1914. Residence and Office, 1704 Pacific Ave., Atlantic City, N. J.

1911.—Davis, Asa Barnes, M.D., F.A.C.S. Attending Surgeon of the Society of the Lying-in Hospital of the City of New York; Consulting Gynecologist to the Vassar Brothers' Hospital, Poughkeepsie, N. Y. 42 E. 35th Street, New York.

1915.—Davis, James Ethelbert, A.M., M.D. Professor of Pathology, Detroit College of Medicine and Surgery; Director of Laboratories, Providence and Woman's Hospital; Pathologist St. Mary's Hospital; Consulting Pathologist Michigan State Board of Health; Ex-President Wayne County Medical Society; Member—The American and Canadian Section of the International Association of Medical Museums; American Medical Association; American Pathological Society. Secretary, 111 Josephine Ave., Detroit, Michigan.

1903.—Davis, John D. S., M.D., LL.D., F.A.C.S. Professor of Surgery in the Post-Graduate School of Medicine of the University of Alabama; Surgeon to Hillman Hospital; Surgeon to Davis Infirmary; ex-President Jefferson County Medical Society; *Vice-president,* 1905; *Vice-president,* 1909. 2031 Avenue G, Birmingham, Ala.

1910.—Dice, William Gordon, A.B., M.D. Obstetrician to Flower and Mercy Hospitals. 240 Michigan Street, Toledo, Ohio.

1909.—Dickinson, Gordon K., M.D., F.A.C.S. Attending Surgeon to the Jersey City Hospital, and Christ Hospital, Jersey City; Consulting Surgeon, Bayonne City Hospital, North Hudson Hospital, Weehawken, and the Stumpf Memorial Hospital, Kearney; *Vice-president,* 1915-1916; Past-president, Medical Society of the State of New Jersey, 1919-1920. 280 Montgomery St., Jersey City, N. J.

1920.—Dorsett, Edward Lee, M.D., F.A.C.S., Capt. M.C., U. S. A., 1918-1919. Attending Obstetrician (Chief of Service), St. Louis City Hospital; Consulting Obstetrician St. Louis Maternity Hospital; Obstetrician and Gynecologist to the Missouri Baptist Sanitarium and

the Evangelical Deaconess Hospital; Assistant in Obstetrics, Washington University School of Medicine; Obstetrician, Out-Patient Department, Washington University School of Medicine. Member of the St. Louis Gynecological Society, the Association of Surgeons of St. Louis, and the St. Louis Surgical Society. Residence, 5093 Washington Blvd.; Office, 505-509 University Club Bldg., St. Louis, Mo.

1920.—Douglass, Fred Melvin, M.D. Surgeon to St. Vincent's Hospital; Surgeon to Lucas County Hospital. Residence, 2046 Franklin Ave.; Office, 421 Michigan St., Toledo, Ohio.

1904.—Elbrecht, Oscar H., Ph. B., M.D., F.A.C.S. Formerly Superintendent and Surgeon in Charge, St. Louis Female Hospital; Visiting Surgeon, St. Louis City Hospital; Consulting Gynecologist, Missouri Pacific Hospital; Consulting Surgeon to St. Louis Maternity Hospital and former Chief of Staff; Consulting Surgeon, Bethesda Hospital; Member of Southern Surgical and Gynecological Association. Residence, Buckingham Hotel; Office, 423 Metropolitan Building, St. Louis, Mo.

1906.—Erdmann, John Frederick, M.D., F.A.C.S. Professor of Surgery, N. Y. Post-Graduate Hospital and Medical School; Consulting Surgeon to Gouverneur Hospital, Southampton Hospital; Mt. Vernon General Hospital, Mt. Vernon, N. Y.; Greenwich General Hospital, Greenwich, Conn.; Nassau Hospital, Mineola, L. I. Director of Surgery, New York Post-Graduate Hospital and Medical School. 60 West Fifty-second Street, New York, N. Y.

1920.—Farr, Robert Emmett, M.D. Attending Surgeon, St. Mary's Hospital. Residence, 2433 S. Bryant St.; Office, 301 Physicians & Surgeons Bldg., Minneapolis, Minn.

1911.—Findley, Palmer, B.E., M.D., F.A.C.S. Professor of Gynecology, College of Medicine, University of Nebraska. 3602 Lincoln Boulevard, Omaha, Neb.

1910.—Foster, Curtis Smiley, A.B., M.D., F.A.C.S. Gynecologist to the Western Pennsylvania Hospital, Pittsburgh. Residence, 5749 Ellsworth Avenue; Office, 308 Diamond Bank Building, Pittsburgh, Pa.

1903.—Frank, Louis, M.D., F.A.C.S. Professor of Abdominal and Pelvic Surgery, Medical Department, University of Louisville, Surgeon Louisville City Hospital; Surgeon to John N. Norton Memorial Infirmary; Consulting Surgeon, Children's Free Hospital; President Mississippi Valley Medical Association, 1912; *Executive Council,* 1913. President Kentucky State Medical Association, 1922-1923. Residence, 1321 Fourth Ave.; Office, 400 The Atherton, Louisville, Kentucky.

1912.—Furniss, Henry Dawson, M.D., F.A.C.S., Professor of Gynecology, New York Post-Graduate Hospital; Attending Gynecologist, New York Post-Graduate Hospital; Consulting Gynecologist, All Souls Hospital, Morristown; Consulting Gynecologist, New Rochelle Hospital; Consulting Gynecologist, St. Agnes Hospital, White Plains, N. Y.; Consulting Cystoscopist, New York Infirmary for Women; Fellow, New York Academy of Medicine, New York Medico-Surgical Society; New York Obstetrical Society, New York State and County Medical Societies, American Medical Association, American Urological Society. Office, 54 East Forty-eighth Street, New York, N. Y.

1921.—Garnett, Alexander Y. Peyton, M.D. Obstetrician, Garfield Hospital, Associate Professor of Obstetrics, Georgetown University; Obstetrician, Georgetown Hospital. Residence, 1612 Twenty-first Street; Office, 1824 Massachusetts Avenue, Washington, D. C.

1902.—Gillette, William J., M.D. Professor of Abdominal Surgery and Gynecology in the Toledo Medical College; Surgeon to Robinwood Hospital. 1613 Jefferson Street, Toledo, Ohio.

1895.—Goldspohn, Albert, M.S., M.D., F.A.C.S. Professor of Gynecology, Post-Graduate Medical School; Surgeon in Chief of Evangelical Deaconess Hospital. *Vice-president*, 1901. Residence, 2118, Office, 2120 Cleveland Avenue, Chicago, Ill.

1912.—Goodman, Sylvester Jacob, Ph.G., M.D., F.A.C.S. Surgeon and Obstetrician to Grant Hospital, Columbus, Ohio. Chief of Obstetric Department, Mercy Hospital, Chief of Obstetric Department, Protestant Hospital, Consulting Gynecologist, Ohio Institution Feeble Minded, Surgeon, Ohio Jewish Infant Home. Major, M.C., U. S. Army, Honorable Discharge. Residence, 1718 Franklin Avenue; Office, 121 South Sixth Street, Columbus, Ohio.

1913.—Hadden, David, B.S., M.D., F.A.C.S. Residence, 6150 Mendocino Ave.; Office, Oakland Bank and Savings Bldg., Oakland, Cal.

1906.—Hall, Joseph Arda, M.D., F.A.C.S., Lieut. Col., M.C., U. S. Army. Clinical Assistant in Gynecology at the Miami Medical College, Cincinnati. 628 Elm Street, Cincinnati, Ohio.

1889.—Hall, Rufus Bartlett, A.M., M.D., F.A.C.S. Professor of Clinical Gynecology in the Ohio-Miami Medical College, Medical Department of University of Cincinnati; Gynecologist to the Cincinnati Hospital; Surgeon in charge of the Hall Hospital; Member of the British Medical Society; of the Southern Surgical and Gynecological Association; of the American Medical Association; of the Ohio State Medical Society (President, 1900); of the Cincinnati Academy of Medicine

(President, 1909); of the Cincinnati Obstetrical Society (ex-President). *Vice-president*, 1891; *President*, 1900; *Executive Council*, 1904-1909. Berkshire Building, 628 Elm Street, Cincinnati, Ohio.

1902.—Hamilton, Charles Sumner, A.B., M.D., F.A.C.S. Professor of the Principles of Surgery in Starling Medical College; Surgeon to Mt. Carmel and the Children's Hospitals. 188 E. State St., Columbus, Ohio.

1921.—Harper, Paul Tompkins, M.D., Ph.B. Clinical Professor of Obstetrics (in Charge of Teaching), Albany Medical College; Attending Obstetrician, Anthony N. Brady Maternity Home; Obstetrician, Albany Hospital. Residence and Office, 289 State Street, Albany, N. Y.

1910.—Harrar, James Aitken, M.D., F.A.C.S. Attending Surgeon to the Lying-in Hospital of the City of New York. Office, 100 East 66th Street, New York, N. Y.

1894.—Hayd, Herman Emil, M.D., M.R.C.S. Eng., F.A.C.S. Surgeon to the Deaconess Hospital; *Vice-president*, 1903; *Executive Council*, 1908-1910; *President*, 1911; *Treasurer*, 1912-1922. 493 Delaware Avenue, Buffalo, N. Y.

1908.—Hedges, Ellis W., A.B., M.D., F.A.C.S. Visiting Surgeon to Muhlenberg Hospital, Plainfield, N. J. 703 Watchung Avenue, Plainfield, N. J.

1919.—Hewitt, Herbert Windham, M.D., F.A.C.S. Attending Surgeon, Grace Hospital. Residence, 251 Rowena Street; Office, 1131 David Whitney Bldg., Detroit, Mich.

1922.—Heyd, Chas. Gordon, B.A., M.D. Professor of Surgery, New York Post-Graduate Medical School and Hospital; Attending Surgeon, New York Post-Graduate Hospital; Consulting Surgeon, Greenwich Hospital, Greenwich, Conn., Morristown Memorial Hospital, Morristown, N. J., Dover Hospital, Dover, N. J.; Member, New York Academy of Medicine, Medical Society of the State of New York, Medical Society of the County of New York, American Medical Association, American College of Surgeons, American Association for Thoracic Surgery, New York Surgical Society, American Association of Gastroenterologists, Association for Study of Internal Secretions. 40 West 52nd St., New York, N. Y.

1910.—Hill, Ira Leon, A.B., M.D. Clinical Instructor of Obstetrics at Cornell University Medical College; Visiting Obstetrician to the Red Cross Hospital; Attending Obstetrician to Sydenham Hospital. 616 Madison Avenue, New York, N. Y.

1905.—Huggins, Raleigh Russell, M.D., F.A.C.S. Surgeon to St. Francis Hospital. *Vice-president*, 1910. 1018 Westinghouse Building, Pittsburgh, Pa.

1901.—Ill, Charles L., M.D., F.A.C.S. Surgeon to the German Hospital; Gynecologist to St. Michael's and Surgeon to St. Barnabas's Hospitals, Newark; Gynecologist to All Souls' Hospital, Morristown. 188 Clinton Avenue, Newark, N. J.

Founder.—Ill, Edward Joseph, M.D., F.A.C.S. Emeritus Surgeon to the Woman's Hospital; Emeritus Medical Director of St. Michael's Hospital; Gynecologist and Supervising Obstetrician to St. Barnabas's Hospital; Consulting Gynecologist to the Beth Israel Hospital of Newark, N. J., to All Souls' Hospital, and Memorial Hospital, Morristown, N. J., and to the Mountain Side Hospital, Montclair, N. J.; Perth Amboy City Hospital, Muhlenberg Hospital (Plainfield), Somerset Hospital (Somerville), Skillman Home for Epileptics, Stumpf Memorial Hospital (Kearney), St. Elizabeth's Hospital (Elizabeth), and St. James Hospital (Newark); Member of the Southern Surgical and Gynecological Association; Vice-president from New Jersey of the Pan-American Medical Congress of 1893; President of the Medical Society of the State of New Jersey, 1907. *Vice-president*, 1893; *President*, 1899; *Executive Council*, 1901-1903. 1002 Broad Street, Newark, N. J.

1906.—Jonas, Ernst, M.D., F.A.C.S. Clinical Professor of Surgery in Washington University Medical School; Surgeon in Charge of the Surgical Clinic at the Washington University Hospital; Gynecologist to the St. Louis Jewish Hospital; Visiting Surgeon to St. Louis City Hospital; Consulting Surgeon to St. John's Hospital; Surgeon to the Martha Parsons Free Hospital for Children. Residence, 4495 Westminster Place; Office, 465 North Taylor Avenue, St. Louis, Mo.

1910.—Jones, Arthur Thoms, M.D., F.A.C.S. Visiting Surgeon to Memorial Hospital, Pawtucket, R. I.; Consulting Surgeon to St. Joseph's Hospital, Providence, R. I., and Woonsocket Hospital, Woonsocket, R. I. Formerly Visiting Surgeon to St. Joseph's Hospital, Providence, and State Hospital for Insane, Howard, R. I. (Vice-President 1917-1918). Office, 131 Waterman Street; Residence, 63 Orchard Ave., Providence, R. I.

1902.—Keefe, John William, M.D., LL.D., F.A.C.S. Surgeon-in-Chief to "The John W. Keefe Surgery;" Consulting Surgeon to the Rhode Island Hospital, Providence City Hospital, St. Joseph's Hospital, Memorial Hospital, Pawtucket and Woonsocket Hospital. *Vice-president*, 1907; *President*, 1916; *Executive Council*, 1911. 262 Blackstone Boulevard, Providence, R. I.

1910.—Kennedy, James W., M.D., F.A.C.S. Associate Gynecologist and Obstetrician to the Philadelphia Dispensary, 1409 Spruce Street, Philadelphia, Pa.

1911.—King, James E., M.D., F.A.C.S. Professor of Clinical Gynecology, Medical Department, University of Buffalo, New York; Attending Gynecologist, Buffalo General and Erie County Hospital and Good Samaritan Dispensary; Fellow Royal Society of Medicine, London, England; Fellow of Am. Gyn. Soc., 1248 Main Street, Buffalo, N. Y.

1908.—Kirchner, Walter C. G., A.B., M.D., F.A.C.S., Major, M.C., U. S. Army. Formerly Superintendent and Surgeon in charge of the St. Louis City Hospital. Visiting Surgeon City Hospital, Consulting Surgeon St. John's Hospital. Office, 229 Metropolitan Building, St. Louis, Mo.

1918.—Kosmak, George W., A.B., M.D., F.A.C.S., Columbia University, College of Physicians and Surgeons, 1899. Attending Surgeon, Lying-In Hospital, N. Y. Consulting Obstetrician, Booth Memorial Hospital, N. Y. Editor, American Journal of Obstetrics and Gynecology. Residence and Office, 23 East 93rd Street, New York City.

1898.—Langfitt, William Sterling, M.D., F.A.C.S. Surgeon in chief to St. John's Hospital. Office, 8047 Jenkins Building, Pittsburgh, Pa.

1921.—Lankford, Burnley, M.D. Major, M.C., U. S. Army. Hon. discharge. President Norfolk Medical Society, 1917. Obstetrician to the Union Mission Home, Norfolk, Va.; Chief of Obstetrical Service, Norfolk Protestant Hospital. Residence, 530 Shirley Avenue; Office 246 West Freemason St., Norfolk, Va.

1914.—Leighton, Adam P., Jr., L. M. (Dublin), M.D. Attending Obstetrician to Dr. Leighton's Maternity Hospital, Portland; Gynecologist to Edward Mason Dispensary, Portland; Chairman of the Maine State Board of Registration of Medicine. Consulting Obstetrician to the Webber Hospital, Biddeford; Consulting Obstetrician to the Gardiner General Hospital, Gardiner. Residence, 261 Western Promenade; Office, 192 State Street; Private Hospital, 109 Emery Street, Portland, Maine.

1915.—Litzenberg, Jennings, A.B., M.D., F.A.C.S. Professor of Gynecology and Obstetrics, University of Minnesota. Residence, 3137 Park Avenue; Office, Donaldson Building, Minneapolis, Minn.

1911.—Lothrop, Earl P., A.B., M.D., F.A.C.S. Gynecologist to the Buffalo Woman's Hospital; Consulting Surgeon to Columbus Hospital, Buffalo; Surgeon to the J. N. Adams Memorial Hospital for Tuberculosis, Perrysburg, N. Y. 153 Delaware Avenue, Buffalo, N. Y.

1913.—Lynch, Jerome Morley, M.D., F.A.C.S. Professor Rectal and Intestinal Diseases, New York Polyclinic; Consulting Surgeon Nassau

Hospital, Mineola, L. I.; Attending Surgeon St. Mary's Hospital, Hoboken, N. J.; Member New York State and County Societies, American Medical Association, American Proctologic Society, North Western Medical and Surgical Society; Surgeon Medical Reserve, U. S. N. Residence and Office, 205 East 61st St., New York City.

1910.—McClellan, Benjamin Rush, A.B., A.M., M.D., F.A.C.S. Capt., M.C., U. S. Army, Member American Medical Association; ex-President Ohio State Medical Society; Surgeon to McClellan Hospital. *Vice-president*, 1921. Residence, 636 South Detroit Street; Office 7 East Second Street, Xenia, Ohio.

1910.—McPherson, Ross, A.B., M.D., F.A.C.S. Attending Surgeon of the Lying-in Hospital of the City of New York; Consulting Obstetrician of the Caledonian Hospital in Brooklyn. Office, 125 East Thirty-ninth Street; Residence, 45 East Sixty-second Street, New York, N. Y.

1914.—Meeker, Harold Denman, A.B., M.D., F.A.C.S., Com., M.C., U. S. N. R. F. Professor of Surgery, Polyclinic Medical School and Hospital, New York; Visiting Surgeon to Park Hospital, New York. Residence, 420 West End Ave.; Office, 47 East 57th St., New York, N. Y.

1920.—Mendenhall, Arthur Monroe, B.S., M.D. Instructor in Obstetrics, Indiana University Medical School. Residence, 3304 Broadway; Office, 333 Newton-Claypool Bldg., Indianapolis, Ind.

Founder.—Miller, Aaron Benjamin, M.D., F.A.C.S. Governor Professor of Gynecology in the Medical Department, Syracuse University; Gynecologist to St. Joseph's Hospital; Consulting Gynecologist to Syracuse Memorial Hospital; Gynecologist to Syracuse General Hospital; Gynecologist to Dispensary. President New York State Board of Medical Examiners. Examiner in Obstetrics and Gynecology New York State Reagent Examinations. *Vice-president*, 1899, 1904; *President*, 1910; *Executive Council*, 1911, 1921, 1922, 1923. 326 Montgomery St., Syracuse, N. Y.

1905.—Miller, John D., M.D., F.A.C.S. Professor of Gynecology, University of Cincinnati; Director of Gynecologic Clinic (Out-patient's Dept.), Cincinnati General Hospital; Gynecologist of Good Samaritan; Christ Hospital, and Cincinnati General Hospital. Residence, 1707 E. McMillan St.; Office, N. W. cor. Eighth and Elm Streets, Cincinnati, Ohio.

1921.—Montgomery, Edward Brewer, M.D., F.A.C.S. Residence, 1461 Vermont Street; Office, 134 North 8th Street, Quincy, Ill.

1911.—Moots, Charles W., B.S., M.D., F.A.C.S. Commander, U. S. N. R. F. Gynecologist to Flower Hospital; President of Academy of

Medicine of Toledo and Lucas County, 1912. Residence, The Belvedere Apts.; Office, 225 Michigan Street, Toledo, Ohio.

1921.—Moran, John Francis, A.B., M.D. Professor of Obstetrics, Georgetown University School of Medicine; Obstetrician, Georgetown University Hospital, Columbia Hospital for Women, and Washington Asylum Hospital. Residence and office, 2426 Pennsylvania Ave., N. W., Washington, D. C.

1907.—Moriarta, Douglas C., M.D., F.A.C.S. Senior Surgeon to Saratoga Hospital; Surgeon in chief to Saint Christina's Hospital for Children; Director of State Experimental Station at Saratoga. 511 Broadway, Saratoga Springs, N. Y.

1890.—Morris, Robert Tuttle, A.M., M.D., F.A.C.S., Maj., M.R.C., U. S. Army. Professor of Surgery in the New York Post-Graduate Medical School and Hospital. *Vice-president*, 1892; *Executive Council*, 1906, 1908-1911; *President*, 1907. 114 East 54th Street, New York, N. Y.

1918.—Mosher, George Clark, A.M., M.D., F.A.C.S. Senior Obstetrician of the Kansas City General and Christian Hospitals; Consulting Obstetrician, Swedish, St. Mary's and Bethany Hospitals; Formerly Professor of Obstetrics and Gynecology, Head of Dept., Medical School of University of Kansas; Founder and ex-President, Kansas City Obstetrical Society. Residence, 361 Locust Street; Office, 605 Bryant Building, Kansas City, Mo.

1896.—Noble, George Henry, M.D., D.C.L., F.A.C.S. Gynecologist to the Grady Hospital; Secretary to the Section on Obstetrics and Gynecology of American Medical Association, 1897; Professor of Clinical Gynecology, Atlanta Medical College (Emery University); Member of the Southern Surgical and Gynecological Association. 186 South Pryor Street, Atlanta, Ga.

1903.—Noble, Thomas Benjamin, M.D. Professor of Abdominal Surgery in the Central College of Physicians and Surgeons; Consultant in the Diseases of Women at the City Hospital, City Dispensary, and Protestant Deaconess's Hospital, Indianapolis. 720 Newton Claypool Building, Indianapolis, Ind.

1907.—Olmsted, Ingersoll, M.D., F.A.C.S. Surgeon to the City and St. Joseph's Hospitals, Hamilton, Ont. 215 South James St., Hamilton, Ontario, Canada.

1899.—Pantzer, Hugo Otto, A.M., M.D., F.A.C.S. Past Professor, Surgical Pathology and Clinical Gynecology, in the Central College of Physicians and Surgeons; Past Professor Clinical Gynecology, Indiana

Medical College, Medical Department of Purdue University; Late Professor of Clinical Gynecology in the Indiana Medical College, Medical Department of Indiana University; Gynecologist to Methodist Hospital; Past President of Indianapolis Medical Society; Member of Indiana State Association and American Medical Association. *President*, 1915. 601 Hume-Mansur Bldg., Indianapolis, Ind.

1916.—Peck, George Augustus, M.D., F.A.C.S. Attending Surgeon, New Rochelle Hospital, New Rochelle, N. Y.; Consulting Surgeon, Westchester County Hospital, New York. Residence and Office, 189 Centre Ave., New Rochelle, N. Y.

1916.—Percy, James Fulton, A.M., M.D., F.A.C.S., Maj., M.C., U. S. Army. Office, Los Angeles County Hospital, Los Angeles, Calif.

1899.—Pfaff, Orange G., M.D. Adjunct Professor of Obstetrics and Diseases of Women in the Medical College of Indiana; Gynecologist to the City, Deaconess's, and St. Vincent's Hospitals, 1337 North Pennsylvania Street, Indianapolis, Ind.

1921.—Pfeiffer, William, M.D., F.A.C.S. Obstetrician in Chief, Brownsville and East New York Hospital; Obstetrician and Gynecologist, Kings County Hospital; Assistant Obstetrician and Gynecologist, Holy Family Hospital. Residence and Office, 368 McDonough Street, Brooklyn, N. Y.

1920.—Polak, John Osborn, M.Sc., M.D., University of Vermont, College of Medicine, 1891; Long Island College Hospital, 1891. Professor of Obstetrics and Gynecology, Long Island Hospital; Obstetrician and Gynecologist, Long Island College Hospital; Director, Obstetrics and Gynecology, Zion Hospital; Consulting Gynecologist, Jewish Hospital; Deaconess, Bushwick, Coney Island, People's and Williamsburgh Hospitals; Consulting Obstetrician, Methodist Episcopal Hospital; Consulting Surgeon, Southampton Hospital, Southampton. Office, 20 Livingston St., Brooklyn, N. Y.

1898.—Porter, Miles F., M.D., F.A.C.S. Chairman of the District Conscript Board No. 2, of Indiana. Professor of Surgery in the Indiana University School of Medicine; ex-President Indiana State Medical Society. *Vice-president*, 1902; *President*, 1912-1913. 2326 Fairfield Ave., Ft. Wayne, Ind.

1902.—Porter, William D., M.D. Professor of Clinical Obstetrics, Medical College, University of Cincinnati; Assistant Director, Obstetrical Department, Cincinnati General Hospital. Residence, 3031 Reading Road; Office, 1 Melrose Building, Cincinnati, Ohio.

1914.—Potter, Irving White, M.D. Attending Obstetrician, St. Mary's Maternity Hospital; Instructor of Obstetrics, Medical Department, University of Buffalo; Attending Obstetrician, German Deaconess Hospital. Residence and Office, 420 Franklin St., Buffalo, N. Y.

1903.—Poucher, John Wilson, M.D., F.A.C.S. Consulting Surgeon, Highland Hospital (Beacon, N. Y.), and Hudson River State Hospital (Poughkeepsie); Chief of Staff and Attending Surgeon, Bowne Memorial Hospital and St. Francis Hospital (Poughkeepsie). Member, Board of Managers of the Hudson River State Hospital. 339 Mill Street, Poughkeepsie, N. Y.

1919.—Quigley, James Knight, A.B., M.D., F.A.C.S. Attending Obstetrician to the Rochester General Hospital; Consulting Obstetrician to the Thompson Memorial Hospital, Canadaigua, N. Y. Regional Consultant, State Department of Health. Member Alumni Society, Lying-in Hospital of the City of New York. Residence, 400 Westminster Road; Office, 303 Alexander Street, Rochester, N. Y.

1904.—Reder, Francis, M.D., F.A.C.S. Visiting Surgeon to St. Louis City Hospital; Consulting Surgeon to St. John's Hospital. Residence, 6346 Pershing Avenue; Office, 415 University Club Building, St. Louis, Mo.

Founder.—Reed, Charles Alfred Lee, A.M., M.D., F.A.C.S. Maj., M.C., U. S. Army. Consulting Gynecologist, Cincinnati General Hospital; President, American Medical Association, 1900-1; Fellow, British Gynecological Society; Chevalier Legion of Honor, France; Fellow, National Academy of Medicine of Peru; President, Seventh Pan-American Medical Congress. *President*, 1898. Residence, 3544 Biddle Avenue; Office, 5 West Eighth Street, Cincinnati, Ohio.

1913.—Rongy, Abraham Jacob, M.D., F.A.C.S. Attending Gynecologist, Lebanon Hospital; Attending Surgeon, Jewish Maternity Hospital; Consulting Gynecologist, Rockaway Beach Hospital. Residence and Office, 345 West 88th Street, New York City.

1909.—Rosenthal, Maurice I., M.D., F.A.C.S. Surgeon to Saint Joseph's Hospital. 336 W. Berry Street, Fort Wayne, Ind.

1920.—Royston, Grandison Delaney, M.D. Instructor in Clinical Obstetrics, Washington University Medical School; Associate Obstetrician, Barnes Hospital; Visiting Staff, St. Louis Maternity Hospital; Chief of Clinic in Obstetrics, Washington University Dispensary. Residence, 633 Hanley Road; Office, Wall Building, St. Louis, Mo.

1920.—Rucker, Marvin Pierce, A.M., M.D. Associate in Obstetrics, Medical College of Virginia; Associate Obstetrician, Memorial and Saint Phillip's Hospitals. Residence, 400 N. Lombardy St.; Office, Medical Arts Bldg., Richmond, Va.

1902.—Runyan, Joseph Phineas, M.D. Division Surgeon to the Choctaw, Oklahoma and Gulf Railroad; Secretary of the Arkansas State Medical Association, President, 1904. State Bank Bldg., Little Rock, Ark.

1906.—Ruth, Charles Edward, M.D., F.A.C.S., Lt. Col. M.R.C., U. S. Army. Professor of Surgery and Clinical Surgery in the Keokuk Medical College (College of Physicians and Surgeons); Surgeon, Iowa M. E. Hospital; Chief of Surgical Service Base Hospital, Camp Dodge, Ia.; Chief Surgical Service of General Hospital No. 2, Baltimore, Md.; Commander, Post Hospital, Fort Wm. McKinley, Rizal, P. I. Iowa Building, Des Moines, Iowa.

1903.—Sadlier, James Edgar, M.D., F.A.C.S. Attending Surgeon, St. Francis Hospital, Poughkeepsie, N. Y.; Surgeon-in-Chief, The Sadlier Hospital, Poughkeepsie, N. Y.; Consulting Surgeon, Highland Hospital, Beacon, N. Y.; Consulting Surgeon, Sharon Hospital, Sharon, Conn. *Vice-president,* 1909. Residence and Office, 295 Mill Street, Poughkeepsie, N. Y.

1909.—Sanes, Kay Isadore, M.D., F.A.C.S., Capt., M.C., U. S. Army. Gynecologist to the West Penn Hospital; Consulting Gynecologist to the Montefiore Hospital, Pittsburgh. Residence, 250 South Atlantic Ave.; Office, Jenkins Building, Pittsburgh, Pa.

1910.—Schildecker, Charles Bushfield, M.D. Assistant Gynecologist to Western Pennsylvania Hospital; Coroner's Physician of Allegheny County. Residence, 414 Rebecca Street; Office, 1105 Park Building, Pittsburgh, Pa.

1921.—Schmitz, Henry, M.D., A.M., F.A.C.S. Professor of Gynecology, and Head of Department, Loyola University School of Medicine; Attending Senior Gynecologist at Mercy Hospital; Attending Gynecologist, Cook County Hospital; Consulting Gynecologist, St. Mary's of Nazareth Hospital; Consulting Radiologist, Augustana Hospital, and Consulting Gynecologist of Misericardia Hospital. Residence, 3051 Logan Blvd.; Office, 25 East Washington St., Chicago, Ill.

1904.—Schwarz, Henry, M.D., F.A.C.S. Professor of Obstetrics, Medical Department of Washington University. *Vice-president,* 1911. 440 North Newstead Avenue, St. Louis, Mo.

1918.—Schwarz, Otto H., M.D. Associate Professor of Obstetrics, Washington University School of Medicine; Obstetrician-in-Chief to Barnes Hospital and the Washington University Dispensary. Residence, 4937 Laclede Ave.; Office, Washington University School of Medicine, Scott and Euclid Aves., St. Louis, Mo.

1899.—Simpson, Frank Farrow, A.B., M.D., F.A.C.S., Lieut. Col., M.C., U. S. Army. Chief Medical Section, Council of National Defense;

Chief Section of Medical Industry. Gynecologist to the Allegheny General Hospital; Consulting Gynecologist to the Columbia Hospital. *Vice-president,* 1906. Jenkins Building, Pittsburgh, Pa.

1912.—Skeel, Arthur Julius, M.D., F.A.C.S. Assistant Professor of Obstetrics, Western Reserve University; Obstetrician to St. Luke's Hospital; Consulting Obstetrician to the Florence Crittenden Home, Consulting Obstetrician to the Woman's Hospital. Residence and Office, 1834 East 65th Street, Cleveland, Ohio.

1901.—Skeel, Roland Edward, M.D., F.A.C.S., M.S., A.M., Major M.C., U. S. Army, Hon. discharged. Formerly Associate Clinical Professor of Gynecology in Western Reserve University; Formerly Gynecologist to St. Luke's, Cleveland, Ohio. Office, 302 Title Insurance Bldg., Los Angeles, Cal.

1922.—Sloan, E. P., M.D. Chief Surgeon to the Mennonite Hospital and St. Joseph Hospital, Bloomington, Ill.; President of the Illinois State Medical Society; Chairman of the Illinois State Board of Health; Vice-President of the Tri-State Medical Society. Office, 1417 North Main Street, Bloomington, Ill.

1910.—Smead, Lewis Frederic, A.B., M.D., F.A.C.S. Surgeon to Flower Hospital and Toledo Hospital, Toledo, Ohio. Residence 620 Nesselwood Ave.; Office, 227 Michigan St., Toledo, Ohio.

1920.—Speidel, Edward, M.D., Ph.G. Professor of Obstetrics, University of Louisville; Chief of Obstetrical Staff, Louisville City Hospital. Residence, The Besten; Office, Francis Bldg., Louisville, Ky.

1902.—Stark, Sigmar, M.D., F.A.C.S. Professor of Gynecology, Medical Department of the University of Cincinnati; Director of First Gynecological Service, Cincinnati General Hospital, and Director of Gynecology, Jewish Hospital. Residence, 1108 E. McMillan St.; Office, 11½ E. Eighth St., Cincinnati, Ohio.

1919.—Stein, Arthur, M.D., F.A.C.S. Visiting Gynecologist, Harlem Hospital; Associate Gynecologist, Lenox Hill Hospital; Consulting Gynecologist, Hospital for Deformities, New York City. Residence and Office, 48 East 74th Street, New York, N. Y.

1908.—Stewart, Douglas Hunt, M.D., F.A.C.S. Adjunct Surgeon, O. P. D. Knickerbocker Hospital. Residence, 128 West 86th Street, New York, N. Y.

1899.—Swope, Lorenzo W., M.D., F.A.C.S. Surgeon to the Consolidated Traction Company; Chief Surgeon to Wabash Railroad, Pittsburgh Division; Surgeon to Western Pennsylvania Hospital; Surgeon to Passavant Hospital; Member of the Allegheny County Medical Soci-

ety; Member of the American Medical Association. Residence, 4629 Bayard Street; Office, 1105 Park Building, Pittsburgh, Pa.

1901.—Tate, Magnus Alfred, M.D., F.A.C.S. Professor of Obstetrics Miami Medical College; President, Cincinnati Academy of Medicine, 1905; Obstetrician to the Cincinnati General Hospital and to the Good Samaritan Hospital. 19 West Seventh Street, Cincinnati, Ohio.

1920.—Titus, Paul, M.D., F.A.C.S. Obstetrician, Western Pennsylvania Hospital, Pittsburgh; Obstetrician and Gynecologist, City Tuberculosis Hospital, Pittsburgh; Pittsburgh City Hospital, and Homes, Mayview. Residence, Alder Court Apts.; Office, Highland Bldg., Pittsburgh, Pa.

1922.—Toombs, Percy W., A.B., M.D., F.A.C.S. Professor of Obstetrics, University of Tennessee College of Medicine; Obstetrician-in-Chief, Baptist Memorial Hospital and Memphis General Hospital; Consulting Obstetrician, Ella Oliver Refuge. Office, 1042 Madison Ave., Memphis, Tenn.

1908.—Torrence, Gaston, M.D. Surgeon to St. Vincent's and the Hillman Hospitals in Birmingham. Residence, 2705 Caldwell Avenue; Office, 325 Woodward Building, Birmingham, Ala.

1917.—Tovey, David William, M.D. Adjunct Professor of Gynecology, N. Y. Polyclinic Medical School; Gynecologist N. Y. Polyclinic Hospital; Gynecologist Harlem Dispensary. Residence and Office, 240 Riverside Drive, New York, N. Y.

1919.—Tracy, Stephen E., M.D., F.A.C.S. Medical Director, Stetson Hospital; Gynecologist to the Stetson, Gynecean and American Hospital for Diseases of the Stomach; Consulting Gynecologist to the Jewish Maternity Hospital. Residence, 615 Sixty-fifth Ave.; Office, 1527 Spruce Street, Philadelphia, Pa.

Founder.—Vander Veer, Albert, A.M., M.D., Ph.D., LL.D., F.A.C.S., Member Volunteer M.C. Five years Professor of Anatomy, Thirty-eight years Professor of Surgery, Albany Medical College; Surgeon-in-Chief, Albany Hospital; Consulting Surgeon, South End Dispensary; Consulting Surgeon, Benedictine Hospital, Kingston, N. Y.; Consulting Surgeon, Champlain Valley Hospital, Plattsburgh, N. Y.; Consulting Surgeon, Crippled and Ruptured Children, West Haverstraw, N. Y.; Fellow of the American Surgical Association (President, 1906); Fellow of the British Gynecological Society; Member of the American Medical Association (First Vice-president and President, 1915); Member of the Southern Surgical and Gynecological Association; Corresponding Member of the Boston Gynecological Society; Vice-Chancellor and Chan-

cellor of the Board of Regents of the University of the State of New York. Member and Ex-President of the Medical Society of the State of New York. Thirty-eight years Professor of General and Abdominal Surgery, Albany Medical College, Retired. *Executive Council*, 1889-1891, 1895-1905; *President*, 1892. 28 Eagle Street, Albany, N. Y.

1913.—Vander Veer, Edgar Albert, Ph.D., M.D., F.A.C.S. Attending Surgeon Albany Hospital; Consulting Surgeon, Champlain Valley Hospital, Plattsburgh, N. Y. Residence, 150 State St., Office, 28 Eagle St., Albany, N. Y.

1912.—Van Sweringen, Budd, M.D., Maj., M.R.C., U. S. Army. Gynecologist to the Lutheran Hospital, Surgeon to Pennsylvania Railroad; Formerly Professor of Medicine, Ft. Wayne College of Medicine. 208 Washington Boulevard, Fort Wayne, Indiana.

1909.—Wade, Henry Albert, M.D., F.A.C.S. Visiting Surgeon to Bethany Deaconess's Hospital; Attending Gynecologist to Williamsburg Hospital, Brooklyn. 495 Greene Avenue, Brooklyn, N. Y.

1891.—Walker, Edwin, M.D., Ph.D., F.A.C.S. Surgeon to the Walker Hospital; Gynecologist to the Evansville City Hospital; President of the Indiana State Medical society, 1892; Member of the American Medical Association and of the Mississippi Valley Medical Association; Member of the Southern Surgical and Gynecological Association; First Vice-president American Medical Association, 1907. *Vice-president*, 1901. 712 South Fourth Street, Evansville, Ind.

1907.—Weiss, Edward Aloysius, M.D., F.A.C.S., Lieut. Com., M.C., U. S. N. R. F. Honorably Discharged. Assistant Professor of Gynecology, School of Medicine, University of Pittsburgh; Chief Gynecologist, Mercy Hospital; Gynecologist, Elizabeth Steele Magee Hospital for Women; Obstetrician to Rosalia Maternity Hospital. *Vice-President*, 1918; *Executive Council*, 1921. 714 Jenkins Building, Pittsburgh, Pa.

1914.—Welton, Thurston Scott, M.D., F.A.C.S. Clinical Instructor of Gynecology and Obstetrics in the Long Island College Hospital; Associate Attending Gynecologist and Obstetrician to the Williamsburgh Hospital; Associate Visiting Gynecologist and Obstetrician to the Greenpoint Hospital; President Brooklyn Medical Society, 1917; Fellow, Brooklyn Gynecological Society. Residence and Office, 842 Union Street, Brooklyn, New York.

1904.—West, James Nephew, M.D., F.A.C.S. Professor of Diseases of Women, New York Post-Graduate Medical School and Hospital. Member, New York County Medical Society; New York Academy Medical Society. *Vice-president*, 1906. 71 West Forty-ninth Street, New York, N. Y.

1921.—Wetherell, Frederick Stephen, M.D. Associate Gynecologist, St. Joseph's Hospital; Instructor in Anatomy, Medical College of Syracuse University. Residence, 111 Durston Avenue; Office, 533 Butternut St., Syracuse, N. Y.

1911.—White, George R., B.S., M.D., F.A.C.S. Surgeon Park View Sanitarium. 2 Liberty E., Savannah, Ga.

1916.—Wing, Lucius Arthur, B.Sc., M.D., Capt., M.C., U. S. Army, Attending Surgeon, Lying-In Hospital, City of New York; Assisting Surgeon, St. Mary's Free Hospital for Children; Instructor in Clinical Surgery, Cornell University Medical College. Office and Residence, 53 East Sixty-fifth Street, New York, N. Y.

1909.—Yates, H. Wellington, M.D., F.A.C.S. Professor of Gynecology and Head of the Department, Detroit College of Medicine and Surgery; Chief of Staff and Head of Department of Gynecology, Receiving Hospital; Attending Gynecologist to Providence Hospital and William Booth Memorial Hospital. Residence, 2475 Edison Ave., Office, 1229 David Whitney Building, Detroit, Mich.

1907.—Ziegler, Charles Edward, A.M., M.D., F.A.C.S. 406 Morewood Avenue, Pittsburgh, Pa.

Total one hundred and thirty-six Ordinary Fellows.

ORDINARY FELLOWS DECEASED

1902.—Abrams, Edward Thomas, A.M., M.D., F.A.C.S., Dollar Bay, Mich., 1918.

1890.—Asdale, William James, M.D., Beaver Falls, Pa., 1912.

Founder.—Baker, Washington Hopkins, Philadelphia, Pa., 1904.

1913.—Blume, Frederick, M.D., Pittsburgh, Pa., 1918.

1896.—Bosher, Lewis C., M.D., F.A.C.S., Richmond, Va., 1920.

1894.—Brown, John Young, M.D., F.A.C.S., St. Louis, Mo., 1919.

1889.—Burns, Bernard, M.D., Allegheny, Pa., 1892.

Founder.—Carstens, J. Henry, M.D., F.A.C.S., Detroit, Mich., 1920.

1890.—Coles, Walter, M.D., St. Louis, Mo., 1892.

1889.—Davis, William Elias B., M.D., Birmingham, Ala., 1903.

1892.—Dorsett, Walter Blackburn, M.D., F.A.C.S., St. Louis, Mo., 1915.

1892.—Duff, John Milton, A.M., M.D., Ph.D., Pittsburgh, Pa., 1904.

1898.—Dunn, James C., M.D., Pittsburgh, Pa., 1907.

1892.—Dunning, Lehman Herbert, M.D., Indianapolis, Ind., 1906.

1899.—Eastmann, Thomas Barker, A.B., M.D., F.A.C.S., Indianapolis, Ind., 1919.

1895.—Ferguson, Alexander Hugh, M.D., Chicago, Ill., 1911.

1890.—Frederick, Carlton Cassius, B.S., M.D., Buffalo, N. Y., 1911.

1913.—Freeland, James Roy, M.D., F.A.C.S., Pittsburgh, Pa., 1917.

1891.—Gibbons, Henry, Jr., A.M., M.D., San Francisco, Cal., 1912.

1904.—Goodfellow, George E., M.D., Los Angeles, Cal., 1910.

1913.—Gray, Frank D., M.E.D., M.D., F.A.C.S., Jersey City, N. J., 1916.

1892.—Haggard, William David, Sr., M.D., Nashville, Tenn., 1901.

Founder.—Hill, Hampton Eugene, M.D., Saco, Me., 1894.

1912.—Hotaling, Albert Steuben, M.D., Syracuse, N. Y., 1913.

1898.—Hyde, Joel W., M.D., Brooklyn, N. Y., 1907.

1897.—Ingraham, Henry Downer, M.D., Buffalo, N. Y., 1904.

1909.—Jacobson, Julius H., M.D., F.A.C.S., Toledo, O., 1919.

Founder.—Jarvis, George Cyprian, M.D., Hartford, Conn., 1900.

1892.—Jelks, James Thomas, M.D., Hot Springs, Ark., 1902.

1910.—Jenks, Nathan, B.S., M.D., F.A.C.S., Detroit, 1916.

Founder.—Lothrop, Thomas, M.D., Buffalo, N. Y., 1902.

1900.—Linville, Montgomery, A.B., M.D., New Castle, Pa., 1910.

1890.—Longyear, Howard Williams, M.D., F.A.C.S., Detroit, Mich., 1921.

1896.—Lyons, John A., M.D., Chicago, Ill., 1919.

1891.—McCann, James, M.D., Pittsburgh, Pa., 1893.

1898.—McCann, Thomas, M.D., Pittsburgh, Pa., 1903.

1911.—Marvel, Emery, M.D., F.A.C.S., Atlantic City, N. J., 1920.

1896.—Mooney, Fletcher D., M.D., St. Louis, Mo., 1897.

1894.—Murphy, John Benjamin, A.M., M.D., F.A.C.S., Chicago, Ill., 1916.

Founder.—Potter, William Warren, M.D., Buffalo, N. Y., 1911.

Founder.—Price, Joseph, M.D., Philadelphia, Pa., 1911.

1896.—Rhett, Robert Barnwall, Jr., M.D., Charleston, S. C., 1901.

1889.—Rohe, George Henry, M.D., Baltimore, Md., 1899.

1892.—Rosenwasser, Marcus, M.D., Cleveland, O., 1910.

1890.—Ross, James Frederick Wm., M.D., C.M., L.R.C.P., Toronto, Ontario, Canada, 1911.

1889.—Seymour, William Wotkyns, A.B., M.D., Troy, N. Y., 1904.

1902.—Simons, Manning, M.D., Charleston, S. C., 1911.

1913.—Smith, Lewis W., A.B., M.D., Pittsburgh, Pa., 1917.

1913.—Stamm, Martin, M.D., F.A.C.S., Fremont, O., 1918.

1911.—Stillwagen, Charles A., Pittsburgh, Pa., 1921.

1914.—Strasser, August Adrian, M.D., F.A.C.S., Arlington, N. J., 1918.

Founder.—Townsend, Franklin, A.M., M.D., Albany, N. Y., 1895.

1907.—Vance, Ap Morgan, M.D., F.A.C.S., Louisville, Ky., 1915.

Founder.—Werder, Xavier Oswald, M.D., F.A.C.S., Pittsburgh, Pa., 1919.

1900.—Zinke, Ernst Gustav, M.D., F.A.C.S., Cincinnati, Ohio, 1922.

Total: Fifty-five.

ORDINARY FELLOWS

Classified

ALABAMA

Davis, John D. S.,	2031 Avenue G.,	Birmingham.
Torrance, Gaston,	325 Woodward Bldg.,	Birmingham.

ARKANSAS

Runyan, Joseph Phineas,	State Bank Bldg.,	Little Rock.

CALIFORNIA

Skeel, R. E.,	302 Title Insurance Bldg.,	Los Angeles.
Buteau, Samuel H.,	1155 Broadway,	Oakland.
Hadden, David,	Oakland Bank and Savings Bldg.	Oakland.
Percy, James F.,	Los Angeles County Hospital,	Los Angeles.

CANADA

Olmsted, Ingersoll,	215 South James St.,	Hamilton, Ontario.

DISTRICT OF COLUMBIA

Garnett, A. Y. P.,	1824 Massachusetts Ave.,	Washington.
Moran, J. F.,	2426 Pennsylvania Ave., N. W.,	Washington.

GEORGIA

Noble, George Henry,	186 South Pryor Street,	Atlanta.
White, George R.,	2 Liberty E.,	Savannah.

ILLINOIS

Sloan, E. P.,	1417 N. Main St.,	Bloomington.
Barrett, Channing,	4245 N. Ashland Ave.,	Chicago.
Goldspohn, Albert,	2120 Cleveland Ave.,	Chicago.
Schmitz, Henry,	25 E. Washington St.,	Chicago.
Bacon, Joseph B.,		Macomb.
Montgomery, Edward B.,	134 North 8th St.,	Quincy.

INDIANA

Walker, Edwin,	712 South Fourth St.,	Evansville.
Porter, Miles F.,	2326 Fairfield Ave.,	Fort Wayne.
Rosenthal, M. I.,	336 West Berry St.,	Fort Wayne.
Van Sweringen, Budd,	208 Washington Blvd.,	Fort Wayne.
Burckhardt, Louis,	621 Hume-Mansur Bldg.,	Indianapolis.
Clark, Edmund, D.,	712 Hume-Mansur Bldg.,	Indianapolis.
Mendenhall, A. M.,	333 Newton-Claypool Bldg.,	Indianapolis.
Noble, Thomas B.,	720 Newton-Claypool Bldg.,	Indianapolis.
Pantzer, Hugo O.,	601 Hume-Mansur Bldg.,	Indianapolis.
Pfaff, O. G.	1337 North Pennsylvania St.,	Indianapolis.

IOWA

Ruth, Charles E.,	Iowa Bldg.,	Des Moines.

KENTUCKY

Frank, Louis,	The Atherton,	Louisville.
Speidel, Edward,	Francis Bldg.,	Louisville.

MAINE

Leighton, Adam P.,	192 State St.,	Portland.

MARYLAND

Branham, Joseph H.,	2200 Eutaw Place,	Baltimore.

MICHIGAN

Bell, John Norval,	1149 David Whitney Bldg.,	Detroit.
Brown, Geo. Van Amber,	13300 Woodward Ave.,	Detroit.
Davis, James E.,	111 Josephine Ave.,	Detroit.
Hewitt, H. W.,	1131 David Whitney Bldg.,	Detroit.
Yates, H. Wellington,	1229 David Whitney Bldg.,	Detroit.

MINNESOTA

Condit, William H.,	Nicollete Clinic,	Minneapolis.
Litzenberg, Jennings C.,	Donaldson Bldg.,	Minneapolis.
Farr, Robert E.,	301 Physicians & Surgeons Bldg.	Minneapolis.

MISSOURI

Mosher, G. C.,	605 Bryant Bldg.,	Kansas City.
Crossen, H. S.,	Metropolitan Bldg.,	Saint Louis.
Dorsett, E. Lee,	University Club Bldg.,	Saint Louis.
Elbrecht, Oscar H.,	Metropolitan Bldg.,	Saint Louis.
Jonas, Ernst,	465 North Taylor Ave.,	Saint Louis.
Kirchner, Walter C. G.,	229 Metropolitan Bldg.,	Saint Louis.
Reder, Francis,	415 University Club Bldg.,	Saint Louis.
Royston, G. D.,	Wall Bldg.,	Saint Louis.
Schwarz, Henry,	440 North Newstead Ave.,	Saint Louis.
Schwarz, O. H.,	Washington University School of Medicine,	Saint Louis.

NEBRASKA

Findley, Palmer,	3602 Lincoln Blvd.,	Omaha.

NEW JERSEY

Darnall, Wm. Edgar,	1704 Pacific Ave.,	Atlantic City.
Dickinson, Gordon K.,	280 Montgomery St.,	Jersey City.
Ill, Charles L.,	188 Clinton Ave.,	Newark.
Ill, Edward J.,	1002 Broad St.,	Newark.
Hedges, Ellis W.,	703 Watchung Ave.,	Plainfield.

NEW YORK

Boyd, James P.,	152 Washington Ave.,	Albany.
Harper, Paul T.,	289 State Street,	Albany.
Vander Veer, Albert,	28 Eagle Street,	Albany.
Vander Veer, Edgar A.,	20 Livingston St.,	Albany.
Pfeiffer, William,	368 McDonough St.,	Brooklyn.
Polak, John O.,	287 Clinton Ave.,	Brooklyn.
Wade, Henry A.,	495 Greene Ave.,	Brooklyn.
Welton, T. Scott,	842 Union St.,	Brooklyn.
Hayd, H. E.,	493 Delaware Ave.,	Buffalo.
King, James E.,	1248 Main St.,	Buffalo.
Lothrop, Earl P.,	153 Delaware Ave.,	Buffalo.
Potter, Irving W.,	420 Franklin St.,	Buffalo.
Chandler, George,	11 East Chestnut St.,	Kingston.
Peck, George A.,	189 Centre Ave.,	New Rochelle.
Bainbridge, W. S.,	34 Gramercy Park,	New York.
Bandler, S. W.,	134 West Eighty-seventh St.,	New York.
Davis, Asa B.,	42 East 35th St.,	New York.
Erdmann, John F.,	60 West Fifty-second St.,	New York.
Furniss, Harry Dawson,	54 East 48th St.,	New York.
Harrar, James A.,	100 East 66th St.,	New York.
Heyd, Chas. Gordon,	40 West 52nd St.,	New York.
Hill, I. L.,	616 Madison Ave.,	New York.
Kosmak, G. W.,	23 East 93rd St.,	New York.
Lynch, Jerome Morley,	205 East 61st St.,	New York.
McPherson, Ross A.,	45 West 62nd St.,	New York.
Meeker, Harold D.,	47 East 57th St.,	New York.
Morris, R. T.,	114 E. 54th St.,	New York.
Rongy, Abraham J.,	345 West 88th St.,	New York.
Stein, Arthur,	48 East 74th St.,	New York.
Stewart, Douglas H.,	128 West 86th St.,	New York.
Tovey, David W.,	240 Riverside Drive,	New York.
West, James N.,	71 West Forty-ninth St.,	New York.
Wing, Lucius A.,	53 East 65th St.,	New York.
Sadlier, James E.,	295 Mill St.,	Poughkeepsie.
Poucher, John W.,	339 Mill St.,	Poughkeepsie.
Brown, Wm. M.,	1776 East Ave.,	Rochester.
Quigley, J. K.,	303 Alexander St.,	Rochester.
Moriarta, Douglas C.,	511 Broadway,	Saratoga Springs.
Miller, A. B.,	326 Montgomery St.,	Syracuse.
Wetherell, Frederick S.,	553 Butternut St.,	Syracuse.

OHIO

Bonifield, Chas. L.,	409 Broadway,	Cincinnati.
Hall, Joseph A.,	628 Elm St.,	Cincinnati.
Hall, Rufus B.,	628 Elm St.,	Cincinnati.
Miller, John D.,	N. W. Cor. 8th and Elm,	Cincinnati.
Porter, W. D.,	Melrose Bldg.,	Cincinnati.
Reed, C. A. L.,	5 West 8th St.,	Cincinnati.
Stark, Sigmar,	11½ East 8th St.,	Cincinnati.
Tate, Magnus A.,	19 West Seventh St.,	Cincinnati.
Zinke, E. G.,	4 West 7th St.,	Cincinnati.
Bill, A. H.,	Osborn Bldg.,	Cleveland.
Crile, George W.,	Cleveland Clinic, Euclid at E. 93rd St.,	Cleveland.
Skeel, Arthur,	1834 East 65th St.,	Cleveland.
Baldwin, James F.,	405 East Town St.,	Columbus.
Crotti, André,	151 East Broad St.,	Columbus.
Goodman, S. J.,	121 South 6th St.,	Columbus.
Hamilton, Chas. S.,	188 E. State St.,	Columbus.
Dice, Wm. Gordon,	240 Michigan St.,	Toledo.
Douglass, Fred M.,	421 Michigan St.,	Toledo.
Gillette, Wm. J.,	1613 Jefferson St.,	Toledo.
Moots, Chas. W.,	225 Michigan St.,	Toledo.
Smead, Lewis F.,	227 Michigan St.,	Toledo.
McClellan, Benjamin R.,	7 East Second St.,	Xenia.

PENNSYLVANIA

Babcock, W. Wayne,	2033 Walnut St.,	Philadelphia.
Kennedy, James W.,	1409 Spruce St.,	Philadelphia.
Tracy, S. E.,	1527 Spruce St.,	Philadelphia.
Foster, Curtis S.,	308 Diamond Bank Bldg.,	Pittsburgh.
Huggins, R. R.,	1018 Westinghouse Bldg.,	Pittsburgh.
Langfitt, William S.,	Jenkins Bldg.,	Pittsburgh.
Sanes, K. I.,	Jenkins Bldg.,	Pittsburgh.
Schildecker, Charles B.,	1105 Park Bldg.,	Pittsburgh.
Simpson, Frank F.,	Jenkins Bldg.,	Pittsburgh.
Swope, Lorenzo W.,	1105 Park Bldg.,	Pittsburgh.
Titus, Paul,	1015 Highland Bldg.,	Pittsburgh.
Weiss, Edward A.,	714 Jenkins Bldg.,	Pittsburgh.
Ziegler, Chas. E.,	406 Morewood Ave.,	Pittsburgh.

RHODE ISLAND

Jones, Arthur T.,	131 Waterman St.,	Providence.
Keefe, John W.,	262 Blackstone Blvd.,	Providence.

TENNESSEE

Toombs, Percy W.,	1042 Madison Ave.,	Memphis.

VIRGINIA

Lankford, Burnley,	246 West Freemason St.,	Norfolk.
Baughman, Greer,	26 North Laurel St.,	Richmond.
Rucker, M. Pierce,	Medical Arts Bldg.,	Richmond.

MINUTES OF THE PROCEEDINGS

OF THE

THIRTY-FIFTH ANNUAL MEETING

OF THE

AMERICAN ASSOCIATION

OF

OBSTETRICIANS, GYNECOLOGISTS,

AND

ABDOMINAL SURGEONS

HELD IN

CHANCELLOR'S HALL, EDUCATION BUILDING

ALBANY, NEW YORK

SEPTEMBER 19, 20 AND 21, 1922.

THIRTY-FIFTH ANNUAL MEETING

September 19, 20 and 21, 1922.

The Fellows whose names appear below were present:

BABCOCK, WILLIAM WAYNE.....Philadelphia
BAINBRIDGE, WILLIAM SEAMAN.....New York City
BILL, ARTHUR HOLBROOK.....Cleveland
BONIFIELD, CHARLES LYBRAND.....Cincinnati
BROWN, GEORGE VAN AMBER.....Detroit
BROWN, WILLIAM MORTIMER.....Rochester
CLARK, EDMUND DOUGAN.....Indianapolis
CRILE, GEORGE W.....Cleveland
DARNALL, WILLIAM EDGAR.....Atlantic City
DAVIS, ASA BARNES.....New York City
DAVIS, JAMES ETHELBERT.....Detroit
DICE, WILLIAM GORDON.....Toledo
DICKINSON, GORDON K.....Jersey City
ERDMANN, JOHN FREDERICK.....New York City
FARR, ROBERT EMMETT.....Minneapolis
FURNISS, HENRY DAWSON.....New York City
HALL, RUFUS BARTLETT.....Cincinnati
HARPER, PAUL TOMPKINS.....Albany
HARRAR, JAMES AITKEN.....New York City
HAYD, HERMAN EMIL.....Buffalo
HEWITT, HERBERT WINDHAM.....Detroit
ILL, CHARLES L.....Newark
ILL, EDWARD JOSEPH.....Newark
JONES, ARTHUR THOMS.....Providence
KEEFE, JOHN WILLIAMS.....Providence
KOSMAK, GEORGE W.....New York City
LANKFORD, BURNLEY.....Norfolk
LEIGHTON, ADAM P.....Portland
LYNCH, JEROME MORLEY.....New York City
McCLELLAN, BENJAMIN RUSH.....Xenia
MEEKER, HAROLD DENMAN.....New York City
MENDENHALL, ARTHUR MONROE.....Indianapolis
MILLER, AARON BENJAMIN.....Syracuse
MILLER, JOHN D.....Cincinnati
MORRIS, ROBERT TUTTLE.....New York City
PANTZER, HUGO OTTO.....Indianapolis

PERCY, JAMES FULTON.....San Diego
PFEIFFER, WILLIAM.....Brooklyn
POLAK, JOHN OSBORN.....Brooklyn
PORTER, WILLIAM D.....Cincinnati
POUCHER, JOHN WILSON.....Poughkeepsie
REDER, FRANCIS.....St. Louis
RONGY, ABRAHAM JACOB.....New York City
ROYSTON, GRANDISON DELANEY.....St. Louis
SADLIER, JAMES EDGAR.....Poughkeepsie
SKEEL, ROLAND EDWARD.....Los Angeles
SLOAN, E. P.....Bloomington
SPEIDEL, EDWARD.....Louisville
TATE, MAGNUS ALFRED.....Cincinnati
TOVEY, DAVID WILLIAM.....New York City
VANDER VEER, ALBERT.....Albany
VANDER VEER, EDGAR ALBERT.....Albany
WEISS, EDWARD ALOYSIUS.....Pittsburgh
WEST, JAMES NEPHEW.....New York City
WETHERELL, FREDERICK STEPHEN.....Syracuse
WING, LUCIUS ARTHUR.....New York City
YATES, H. WELLINGTON.....Detroit

The following named registered guests were extended the privileges of the floor and invited to participate in the discussions:

ABRAMS, H. C.....Newtonville, N. Y.
BRAND, WALTER.....Toledo, Ohio
CLARK, K. S.....Schenectady, N. Y.
COSGROVE, S. A.....Jersey City, N. J.
CRIST, O. H.....Danville, Ill.
CURTIS, F. C.....Albany, N. Y.
DODD, V. S.....Pittsfield, Mass.
DOW, DAVID O.....Cambridge, Mass.
ESMER, M. S.....Pittsfield, Mass.
GAZELEY, WM. E.....Schenectady, N. Y.
GILNER, GEO. M.....Rochester, N. Y.
GRANT, ARTHUR ROGERS.....Utica, N. Y.
GUISNER, ALLEN.....Schenectady, N. Y.
HEATH, H. H.....Toledo, Ohio
HERNLEY, W. E.....Martinsville, Va.
HOLCOMB, F. W.....Kingston, N. Y.
HOLDING, A. T.....Albany, N. Y.
HUGHES, WM. M.....Albany, N. Y.
JENKINS, T. W.....Albany, N. Y.
KATHAN, D. P.....Schenectady, N. Y.

KEIGHN, R. C. ..... SCHENECTADY, N. Y.
KENT, F. M. ..... BELLEVUE, OHIO
KEOUGH, M. K. ..... COHOES, N. Y.
LYONS, JAMES S. ..... ALBANY, N. Y.
MABY, W. JOHN ..... MECHANICSVILLE, N. Y.
MARSH, JAMES P. ..... TROY, N. Y.
MILLER, W. PORTER ..... SYRACUSE, N. Y.
MORROW, E. L. ..... ALBANY, N. Y.
NOYES, I. H. ..... PROVIDENCE, R. I.
PANYDON, A. H. ..... SCHENECTADY, N. Y.
SAULDSTER, A. C. ..... MARTINSVILLE, VA.
SMITH, FRED. W. ..... UTICA, N. Y.
SMITH, EARL R. ..... ALBANY, N. Y.
SMITH, ROY S. ..... ALBANY, N. Y.
STANTON, BRYON ..... CINCINNATI, OHIO
THOMSON, A. W. ..... POUGHKEEPSIE, N. Y.
WARDELL, C. M. ..... SCHENECTADY, N. Y.
WELLS, A. E. ..... SCHENECTADY, N. Y.
WORKS, B. O. ..... BROWNSVILLE, TEXAS
VAN WOERT, S. ..... DELMAR, N. Y.

FIRST DAY.—*Tuesday, September* 19, 1922

Morning Session.—The Association met in Chancellor's Hall and was called to order at 9 A.M. by the President, Dr. Roland E. Skeel, Los Angeles, California.

Mr. Thatcher, of Albany, in the absence of the Mayor, delivered an address of welcome. Addresses of welcome were also delivered by A. S. Downing, First Assistant Commissioner of Education and Director of Professional Education of the University of the State of New York; by Dr. Thomas W. Jenkins, President of the Albany County Medical Society, and by Dr. Albert Vander Veer, of Albany.

The responses to these addresses of welcome were made by Dr. Arthur H. Bill, Cleveland, Ohio.

Papers were then read and discussed as follows:

1. "Tumors of the breast," by Dr. John F. Erdmann, New York City.

This paper was discussed by Drs. Brown, James E. Davis, Keefe, Dickinson, Ill., and in closing by the essayist.

2. "The cervix a focal point of infection, with a unique case in illustration," by Dr. Gordon K. Dickinson, Jersey City, New Jersey.

Discussed by Dr. Yates.

3. "Radium in the treatment of uterine hemorrhage of nonmalignant type," by Dr. Edward A. Weiss, Pittsburgh, Pennsylvania.

4. "The present status of surgery in the treatment of fibromyomata uteri," by Dr. Stephen E. Tracy, Philadelphia, Pennsylvania.

These two papers were discussed together by Drs. Polak and Babcock, after which the discussion was closed by the essayists.

5. "Clinical aspects of blood loss in labor," by Dr. Paul T. Harper, Albany, New York.

Discussed by Drs. Royston, Polak and Speidel.

6. "Uterine displacements and sterility," by Dr. Benjamin Rush McClellan, Xenia, Ohio.

Discussed by Drs. Hayd, Hall, Pfeiffer, Polak and Speidel.

On motion, the Association took a recess until 2:30 P.M.

Afternoon Session.—The Association reconvened at 2:30 P.M. and was called to order by the President.

7. "Hernia of the female internal genitalia through the inguinal canal," by Dr. Herbert W. Hewitt, Detroit, Michigan. (No discussion.)

8. "Pituitrin in the second stage of labor," by Dr. Magnus A. Tate, Cincinnati, Ohio.

Discussed by Drs. Speidel, Royston, Leighton, Yates, Cosgrove, Quigley, and Reder, after which the discussion was closed by the essayist.

9. "Functional dystocia in normal pelves; recognition and management," by Dr. James A. Harrar, New York City.

This paper was discussed by Drs. Quigley, Bill, Speidel, Tate, Harper, Lankford, and in closing by the essayist.

10. "Should pubiotomy be recognized as a justifiable operation in obstetrics?" by Dr. Arthur H. Bill, Cleveland, Ohio, which was discussed by Drs. Leighton, Polak, J. E. Davis, Tate, Quigley, and in closing by the essayist.

11. "Malformations of the uterus and appendages, with a report of six cases," by Dr. Arthur T. Jones, Providence, Rhode Island.

Discussed by Drs. Hayd, Tovey, Hall, and Tate.

12. "Report of genital malformation in a child of eight years, associated with acute suppurative appendicitis," by Dr. H. Wellington Yates, Detroit, Michigan.

Discussed by Drs. Brown, Farr, Hall, Tovey, and in closing by the essayist.

13. "The tragedy of a sacral periosteal sarcoma," by Dr. Francis Reder, St. Louis, Mo.

Discussed by Drs. Percy, Babcock, Bainbridge, and in closing by the essayist.

14. "Craniotomy," by Dr. A. M. Mendenhall, Indianapolis, Indiana.

Discussed by Drs. Leighton, Pfeiffer, Speidel, Lankford, Porter, Bill, and in closing by the essayist.

On motion, the Association adjourned until 9 A.M., Wednesday, September 20.

SECOND DAY.—*Wednesday, September* 20, 1922

Morning Session.—The Association met at 9 A.M. and was called to order by the President.

15. "Double salpingo-oophorectomy with partial auto ovarian transplantation, followed by twelve years of menstruation, a normal pregnancy and an uncomplicated menopause at fifty-one years of age," by Dr. William Seaman Bainbridge, New York City.

Discussed by Drs. Tracy, Babcock, West, and in closing by the essayist.

16. "Transplantation of the cervix," by Dr. W. Wayne Babcock, Philadelphia, Pennsylvania.

Discussed by Drs. Brown, Tracy, and in closing by the essayist.

17. "The pernicious effects of the use of stems in the uterus and the danger of introducing sounds and other foreign bodies without preparation," by Dr. James N. West, New York City.

This paper was discussed by Drs. Hayd, Royston, Polak, Ill, Pantzer, Bainbridge, Quigley, McClellan, Jones, Leighton, and Skeel, after which the discussion was closed by the essayist.

18. "What is the procedure in cases of dry labor, with undilated soft parts, with a study of the relative value of the several types of section," by Dr. John Osborn Polak, Brooklyn, New York.

Discussed by Drs. Royston, Porter, Quigley, Bainbridge, J. E. Davis, Tate, Mendenhall, and in closing by the essayist.

19. "Obstetrico-gynecological diagnosis; three unusual cases," by Dr. Adam P. Leighton, Jr., Portland, Maine.

Discussed by Drs. Clark, Lankford, Tovey, Brown, Speidel, Bonifield, and in closing by the essayist.

20. "An operation for retrodisplacements of the uterus," by Dr. John W. Keefe, Providence, Rhode Island.

Discussed by Drs. Polak, Hayd, West, Tate, Ill, Baldwin, Bonifield, Tovey, Morris, Hall, and in closing by the essayist.

21. "President's Address," by Dr. Roland E. Skeel, Los Angeles, California.

At the conclusion of the President's Address, Dr. Bonifield moved that a committee of three be appointed to consider what action should be taken in regard to the suggestions and recommendations made in the President's Address.

Seconded by Dr. Polak and carried.

On motion, the Association took a recess until 2 P.M.

Afternoon Session.—The Association reconvened at 2 P.M. and was called to order by Dr. Gordon K. Dickinson.

22. "Transplantation of human ovaries; present status and future possibilities," by Dr. William Seaman Bainbridge, New York City.

This paper was discussed by Drs. Heyd, Morris, J. E. Davis, and in closing by the essayist.

23. "The importance of palpation of the pelvic ureters in the diagnosis of abdominal disease," by Dr. David W. Tovey, New York City.

24. "Observations with comments on a study of the urinary tract of eighty fetuses and young infants," by Dr. G. Van Amber Brown, Detroit, Michigan.

25. "Renal tuberculosis; diagnosis and treatment," by H. Dawson Furniss, New York City.

26. "Bladder surgery in relation to the fourth era of surgery," by Dr. Robert Tuttle Morris, New York City.

These four papers were discussed jointly by Drs. Polak, Morris, West, Brown, Reder, J. E. Davis, and Tracy, after which the discussion was closed by Drs, Brown and Furniss.

27. "Twin tubal pregnancy," by Dr. William Edgar Darnall, Atlantic City, New Jersey.

Discussed by Dr. Baldwin.

28. "Gonorrheal arthritis in pregnancy," by Dr. Grandison D. Royston, St. Louis, Mo.

Discussed by Drs. Brown, Tracy and Davis.

29. "A routine treatment for hyperemesis gravidarum," by Dr. Edward Speidel, Louisville, Kentucky.

Discussed by Drs. Tate, Hayd, Kosmak, Baldwin, Polak, Yates, Brown, Quigley, Rongy, and in closing by the essayist.

It was moved and seconded that a letter of sympathy be sent by the secretary to Dr. George F. Chandler, of Kingston, who during this session had undergone an operation. The motion passed and an appropriate letter was sent by the secretary.

On motion, the Association adjourned until 9 A.M. Thursday, September 21.

Third Day, *Thursday, September* 21, 1922

Morning Session.—The Association met at 9 A.M. and was called to order by the President.

30. "Contagious impetigo in the newborn," by Dr. William Mortimer Brown, Rochester, New York. (No discussion.)

31. "Cancer of the colon," by Dr. Jerome M. Lynch, New York City.

Discussed by Drs. Heyd, Tovey, West, and in closing by the essayist.

32. "Primary sterility," by Dr. A. J. Rongy, New York City.

Discussed by Drs. Morris, West, Bonifield, Yates, Dickinson, J. E. Davis, Tracy, Tovey, Pfeiffer, Brown, Pantzer, Skeel, and in closing by the essayist.

33. "Symptoms and signs of extrauterine pregnancy at or near term, with report of two cases seen in Dr. Irving Potter's practice, and the treatment of late ectopic gestation," by Dr. Herman E. Hayd, Buffalo, New York.

Discussed by Drs. Dickinson, Hall, Rongy, Speidel, Yates, and Porter, and in closing by the essayist.

34. "The defenseless areas of the abdomen," by Dr. George W. Crile, Cleveland, Ohio.

Discussed by Drs. Morris, Dickinson, Lynch, and in closing by the essayist.

35. "Surgical strategy as an adjunct to local anesthesia in abdominal surgery," by Dr. Robert Emmett Farr, Minneapolis, Minnesota.

Discussed by Drs. Brown, Rongy, Bainbridge, Percy, and Skeel, and in closing by the author of the paper.

On motion, the Association took a recess until 2 P.M.

Afternoon Session.—The Association reconvened at 2 P.M. and was called to order by the President.

36. "Habitual abortion; case reports," by Dr. James K. Quigley, Rochester, New York.

Discussed by Drs. Rongy, Davis, and Dickinson.

37. "Uterine carcinoma and its treatment by continuous low heat," by Dr. James F. Percy, San Diego, California.

Discussed by Drs. Hall, Skeel, Miller, Brown, Dickinson, J. E. Davis, Wetherell, Hall, after which the discussion was closed by the essayist.

38. "Historical review of the origin and growth of our Association," by Dr. Albert Vander Veer, Albany, New York.

The following papers were read by title:

1. "Report of a case of chorea gravidarum," by Dr. Greer Baughman, Richmond, Virginia.

2. "Purpura hemorrhagica in pregnancy," by Dr. George C. Mosher, Kansas City, Missouri.

3. "Further observations on placenta previa," by Dr. Ross McPherson, New York City.

4. "Case reports," by Dr. Irving W. Potter, Buffalo, New York.

5. "Anatomical irregularities, as a primary cause of abdominal disease," by Dr. Hugo O. Pantzer, Indianapolis, Indiana.

6. "Adhesions—causes, prevention, symptoms, and treatment," by Dr. Miles F. Porter, Fort Wayne, Indiana.

7. "A clinical study of the puerperium," by Dr. M. Pierce Rucker, Richmond, Virginia.

8. "Report of cases of puerperal sepsis treated by blood transfusions," by Dr. J. P. Runyan, Little Rock, Arkansas.

9. "The surgical treatment of certain puerperal infections," by Dr. James F. Baldwin, Columbus, Ohio.

10. "Is supravaginal hysterectomy ever justifiable?" by Dr. J. Wilson Poucher, Poughkeepsie, New York.

11. "Hemorrhages in the newborn," by Dr. Lucius A. Wing, New York City.

12. "Ovary; its relation to pelvic and general states," by Dr. Samuel W. Bandler, New York City.

13. "The mammae as organs of internal secretion," by Dr. David Hadden, Oakland, California.

Dr. Charles L. Bonifield presented an In Memoriam on Dr. E. Gustav Zinke.

Dr. Herman E. Hayd presented an appreciation of Dr. Zinke, which was followed by a tribute to Dr. Zinke by Dr. H. Wellington Yates.

The following newly elected officers were installed: President, Dr. Gordon K. Dickinson, Jersey City, New Jersey; First Vice-President, Dr. G. Van Amber Brown, Detroit, Michigan; Second Vice-President, Dr. James A. Harrar, New York City; Secretary, Dr. James E. Davis, Detroit, Michigan; Treasurer, Dr. William G. Dice, Toledo, Ohio.

Philadelphia, Pennsylvania, was selected as the next place of meeting.

On motion, which was duly seconded and carried, the Association adjourned *sine die.*

James E. Davis, M.D., *Secretary.*

EXECUTIVE SESSIONS

Tuesday, September 19, 1922

The President, Dr. Roland E. Skeel, in the Chair.

The Secretary presented a report of the first meeting of the Executive Council, stating that there were present at this meeting Drs. Skeel, Hayd, Pantzer, Weiss, Miller, Erdmann, Vander Veer and Davis.

The resignations of Drs. Manton, Sellman and Haggard were received, and it was recommended by the Executive Council that they be accepted.

Seconded and carried.

The following new members were voted on and declared duly elected: Dr. C. G. Heyd, New York City; Dr. Edwin P. Sloan, Bloomington, Illinois, and Dr. Percy W. Toombs, Memphis, Tennessee.

It was moved, seconded and carried that the Secretary receive a

salary of $500.00 plus $250.00 for a stenographer, and also his traveling expenses.

It was moved, seconded and carried that a committee be appointed by the President to revise the Constitution and By-Laws.

The Secretary presented his report, which was accepted and placed on file.

Dr. Herman E. Hayd presented his report as Treasurer, which showed a balance in the treasury of $1435.57. The reports were referred to an Auditing Committee consisting of Drs. Hugo O. Pantzer and A. B. Miller.

The Secretary presented the report of the Committee on Maternal Welfare, in the absence of its Chairman, Dr. Mosher, Kansas City, Missouri, as follows:

Preliminary Report of the Committee on Maternal Welfare

(Appointed at St. Louis, 1921)

STATISTICS of morbidity and mortality, gathered in the United States during the last twenty years, 1901 to 1921, show that in toxemia and septic infection the curve of incidence is upward, in spite of the improvement shown by the records of our maternity hospitals in that period. This striking contrast demonstrates how easily the general condition may be ameliorated.

The fact that the large majority of the mothers of America are delivered in the home, and will continue to be managed by the general practitioner, explains the difficulty. It is the surgical operation in unsurgical environment.

It is desired to solicit the cooperation of the Fellows in the elaboration of a complete scheme of maternal welfare, emphasizing the most important points in the development of a plan, with the view of educating the profession and the public, as to the necessity of such work; and to serve as a basis for governmental activity, to be later inaugurated, cooperating with our individual efforts.

The following outline is presented as a suggestion of the needs which are paramount:

1. Preservation of the life and health of the mother.
   - A. Decrease in the number of infections following abortion and childbirth.
     - a. By providing better trained attendants.
     - b. By educating the laity as to the necessity of proper preparation of the patient, and her proper supervision during pregnancy.
     - c. By medical inspection and control of institutions caring for maternity cases.

B. Prophylaxis of Pregnancy.
   a. Control of toxemias, by educating the laity to regard the importance of pregnant women placing themselves under competent medical care, and to be advised as to diet, and mode of living; and also as to the recognition of any symptoms which may arise.
   b. Prevention of venereal disease in association with pregnancy and treatment of such cases which develop.

2. Encouragement of the number of fruitful pregnancies.
   A. By lessening sterility.
      a. By prevention of infections following childbirth and abortion.
      b. By diminution of venereal disease, especially of Neisserian infection.
   B. Lessening the frightful prevalence of abortions.
      a. By decreasing the number of spontaneous abortions by educating young married women, who are pregnant, as to proper care when threatening symptoms develop.
      b. By lessening the number of induced abortions.
         a. Self-induced.
         b. Criminal operations.
         c. Therapeutic abortions.

N. B.

A. It is recommended that hospitals require the written sanction of at least two reputable medical men, before permission to perform an abortion is granted.

B. The desirability of having declared that abortions are reportable to the health authorities, should be discussed.

3. Diminution of the number of deaths of prematurely born infants.
   A. By education of profession and parents, and supervision of these cases.
   B. By provision for the better care of premature infants generally.
   C. By recognition and treatment of syphilis.

4. Diminution in the number of stillbirths.
   A. Improvement of statistics and methods of reporting stillbirths, with causes.
   B. By education of both profession and laity.
   C. By provision of better antepartum and intrapartum care.
   D. By better care of syphilitics.

5. Diminution in the number of neonatal deaths.
   A. By recognition of the importance of these deaths.
   B. By methods of prevention.
   C. By education of the profession and laity.
   D. By provision of better antenatal, intrapartum and postpartum care.

N. B.

More careful scientific study of both stillbirths and neonatal deaths, together with causes of abortion, miscarriage and premature births is of vital importance.

6. Better facilities for the care of the unmarried mother, for her own protection and that of her offspring.
   A. A clear understanding of the relationship of this work to other health and welfare activities, such as infant and child welfare, venereal disease campaigns, Red Cross and nursing activities and to certain eugenic problems.
   B. Recognition of this need on the part of Boards of Health, and social agencies.

N. B.

This problem is so often overlooked in many communities, the result is pathetic, indeed tragic.

7. Proposing some responsible agency of representative and well qualified men to advise with the governmental agencies on the problems of maternal welfare, which will consolidate the efforts of those interested in the welfare of mothers. This organization may be enlarged to become a part of an effective institution which could well be an advisory body on matters pertaining to public health and welfare.
8. To work out problems of maternal and child welfare in cooperation with the pediatrists, by means of a joint committee representative of the leading national societies.

   It is recommended that this committee act in cooperation with the similar committees of the American Gynecological Society, and the Child Hygiene Society, and that, therefore, the cooperation of similar committees representing these organizations and also the American Pediatric Society to elaborated maternal and infant welfare programs be secured.

N. B.

Since the teaching of obstetrics covers so vast a field, and since the crying need for the immediate emergency may be met by the program here outlined, it is not deemed advisable to suggest any reform in the undergraduate teaching of obstetrics until a later occasion.

George Clark Mosher, M.D.
Chairman

Geo. W. Kosmak, M.D.
Henry Schwarz, M.D.

A committee, consisting of Drs. John O. Polak, Chairman, W. G. Dice, and G. A. Royston was appointed to abstract the report of the Chairman of this Committee and make its report at a subsequent session.

Dr. Pantzer reported that the Auditing Committee had examined the books and accounts of the Treasurer and had found them correct.

It was moved, seconded and carried that the report be accepted.

As there was no further business to come before the executive session at this time, an adjournment was taken until 5 P.M., Wednesday, September 20.

Wednesday, September, 20, 1922

The President in the Chair.

The committee appointed to consider and abstract the preliminary report of the Committee on Maternal Welfare reported as follows:

Having carefully read over the exhaustive report of the Chairman of the Committee on Maternal Welfare in its several phases, and being fully agreed as to his investigations, and in view of the high morbidity and mortality among the pregnant and parturient women, and the high infant mortality not only from poor attendants and the frequency of self induced criminal and therapeutic abortions, all of

which are preventable by proper education of profession and laity, it is recommended by this committee that the present committee from this Association be continued and authorized in connection with similar committees from the American Gynecological Society, the Child Hygiene Society, and the American Pediatric Society to spread this propaganda through the profession, and particularly through the several agencies, such as the Red Cross, the American Society for the Prevention of Venereal Disease, District Nursing Association, and Boards of Health to the lay public and the profession, so that problems of maternal and child welfare may be rationally dealt with.

Signed,

J. O. Polak,
W. G. Dice,
G. A. Royston.

Dr. Brown moved the adoption of the report. Seconded.

After discussion by Dr. George W. Kosmak, the motion was put to a vote and the report was adopted.

Dr. Hayd moved that the preliminary report on maternal welfare be adopted.

Seconded by Dr. Yates and carried.

The President appointed as a committee to revise the Constitution and By-Laws, Dr. Edward A. Weiss, Hugo O. Pantzer, and the Secretary.

The election of officers being the next order of business, the following were nominated and declared duly elected: President, Dr. Gordon K. Dickinson, Jersey City, New Jersey; First Vice-President, Dr. G. Van Amber Brown, Detroit, Michigan; Second Vice President, Dr. James A. Harrar, New York City; Secretary, Dr. James E. Davis, Detroit, Michigan; Treasurer, Dr. William G. Dice, Toledo, Ohio; Members of the Executive Council, Dr. Herman E. Hayd, and Dr. Roland E. Skeel.

Dr. Bainbridge moved that a vote of appreciation be extended to Dr. Hayd, the former treasurer, for the splendid work he had rendered the Association during the past ten years.

Seconded and unanimously carried.

Philadelphia, Pennsylvania, was selected as the place of meeting for the 1923 session.

The matter of publication of the proceedings of the Association in journal form, and then in book form was brought up and freely dis-

cussed by Drs. Hayd, Kosmak, Bonifield, Hall, Skeel, Tracy, West, and Keefe, after which Dr. Bainbridge moved that this matter be left to the Executive Council to consider and report to the Association next year.

Seconded and carried.

Dr. Bainbridge stated that the volume of transactions for 1921 was bound in cloth by order of the Executive Council. As this binding did not conform with the binding of the other 33 volumes of the transactions, many of the members felt that the Association should return to the old binding. In fact, many members had already had their cloth bound volume rebound to conform with the other 33 volumes. Accordingly, he moved that it be the sense of the Fellows that the Association return to the former binding, in order to make the volumes uniform. Seconded by Dr. Sadlier.

Secretary Davis called attention to the fact that two types of binding had been previously used; one, a cloth bound copy, which was sent to libraries, and the other, bound in Morocco, is furnished to the Fellows.

The motion was put to a vote and carried unanimously.

The business of the executive session having been completed, on motion, which was duly seconded and carried, the Association adjourned *sine die.*

James E. Davis, M.D., *Secretary.*

PAPERS

READ AT THE

THIRTY-FIFTH ANNUAL MEETING

OF THE

AMERICAN ASSOCIATION

OF

OBSTETRICIANS, GYNECOLOGISTS,

AND

ABDOMINAL SURGEONS

HELD IN

CHANCELLOR'S HALL, EDUCATION BUILDING

ALBANY, NEW YORK

SEPTEMBER 19, 20 AND 21, 1922

PRESIDENTIAL ADDRESS

By Roland E. Skeel, M.D., Los Angeles, California

IN casting about for a subject sufficiently dignified and important to bring before this Association my thought was arrested by the probability that any one surgical, gynecologic or obstetric question with which I might be qualified to deal would be better understood by most of those before me, hence my decision to wander for a few moments into the field of Association policy, a decision perhaps the more timely because this year for the first time we meet without the guidance of one for whom the welfare of this Association has been second only to that of his own family for more than a decade. I speak of course of Dr. Zinke whose loss we feel most keenly, whose influence was always for the best, and whom any of us would be honored in eulogizing were it not to be better done by one who knew his personal life more intimately than the rest.

At the outset I wish to disclaim any special liking for the term standardization as we now understand it with reference to medical and surgical procedures, hospital organization, etc. Indeed the word itself implies permanency, a state which obviously is impossible in any department of surgery at a stage in its career when new light is thrown daily upon its problems. Stability, however, meaning such a degree of standardization as will contribute to a fairly uniform practice under the usual circumstances is highly desirable, and this degree of standardization has been reached in certain diseases of which cystadenoma of the ovary, cancer of the breast and pyosalpinx are examples. True, minor details vary with individual surgeons, depending upon their temperament, surgical judgment, and operative facilities, but the basic principles underlying the management of these surgical disorders are recognized and followed by all.

However, the status of the present day operative treatment of these conditions was not reached by a single step. On the contrary it was fought through, over years of advance and recession, with change of thought and technic, and while the originator of the operation may not have lived to see his ideas completely vindicated, his immediate followers did. The work of Sir Spencer Wells for ovariotomy, and Lawson Tait and our own Price for salpingectomy, exemplify what we have in mind, while Halstead, the chief exponent of radical extirpation for cancer of the breast must have derived great satisfaction from a contemplation of the complete acceptance of his ideas, and the enormous lessening of suffering and the saving of life which this acceptance carried with it.

In the treatment of the greater number of surgical disorders in the abdomen and the complications arising during pregnancy and labor, no such consensus of opinion exists; indeed, even in the management of normal labor a new school is arising which insists that every obstetric patient shall be converted into an operative case if only the obstetrician can get to it before the baby is born. From the pronouncements of another school one would be inclined to believe that cesarean section was the only legitimate method of delivery of a patient whose labor was a bit delayed and whose vagina had not been contaminated, and of course once a cesarean always a cesarean, while the methods of treatment for eclampsia are as far apart as the poles. To mention but a few on the surgical side: if one accepted all the literature, cancer of the cervix is curable by operation in over half of all cases presenting themselves and is never cured, radium cures many and cures none, the chronic appendix has subsided and the gall bladder has taken its place, in fact there must be a veritable epidemic of cholecystitis extending over the land, while peptic and duodenal ulcers are cured by medical and surgical treatment, and cured by neither.

What is now occurring in the study of the pathology, symptomatology and treatment of these surgical lesions, fundamentally is the same struggle which took place when Spencer Wells took up the routine practice of ovariotomy and Tait in England and Price in this country urged a knowledge of the true pathology and treatment of pyosalpinx. only increased in intensity by the great variety of intraabdominal lesions which are revealed through the study of living pathology at the operating table; and multiplied many times by the number of operators and the present day opportunity afforded to publish their views. This struggle must proceed until some degree of stability is reached, but meantime great harm is done by the wordy barrage which comes from all directions, whose component parts are fired by skilled observers and writers, by those whose powers of observation and expression are limited, and by a multitude who shoot simply to make a noise and attract attention to themselves.

But little damage would be done if this barrage of words, facts and opinions was exploded at the mouth of the gun, as it were, and went no further; but the medical, exactly as the general public, still clings to the tradition of infallability in the printed word. Further, if this printed matter found its way only into the hands of those able to estimate it at its proper value it would be of minor importance, but the reverse actually is true. *Too much writing for publication of undigested, imperfect opinion is the bane of true surgical progress today.* When an unusual observation or the report of a unique method of operation, emanating from a source usually regarded as authoritative in a given

line, is presented to an expert in that line, he is able to assimilate it, place it in its proper position and compare it with his own observations. If it is a new idea in etiology, pathology or symptomatology he seeks to confirm or overthrow it. If a new operation, he approaches it with the greatest care and circumspection. As an expert he understands the fallibility of authorities and weighs their promulgations accordingly, and if he is a really big man he recognizes that the intellectual giant, with intellectual honesty, who is never consciously or unconsciously swerved by the hope of personal advantage, and whose opinions can be followed without hesitation, in other words the Oslers of the profession arise only once or twice in a generation.

To the less experienced and the beginner in surgery the matter presents itself in a different light. Eager to learn, desirous of being fully abreast of the times, the published views confirm some ill-defined, vague notions of his own, and that which may have been purely speculative in the mind of the author is accepted as demonstrated fact by the reader, who thereupon hastens to present a paper upon the same or an allied subject. Multiply this one example by the hundreds, who, with laudable ambition, are hastening to break into print and give their brain children an airing, and we have an explanation of the confusion which exists in the medical literature of the day.

Another class, which the profession has vainly tried to eliminate for many years, is composed of those individuals always seeking an excuse to operate. The great bulk of our profession is sound and conscientious to the core; but admission to a medical school, graduation therefrom and subsequent interneship in a hospital, cannot remake the man who has entered the profession with his eye on its presumed monetary advantage and who has a total disregard for human health and happiness; consequently the occasional black sheep. These are vastly encouraged by the printed opinion of celebrities that cholecystectomy, panhysterectomy, cesarean section and version are operations legitimately practiced for trivial indications; as they sometimes may be by the truly expert, but never are in the hands of the last year's graduate or occasional operator among general practitioners.

The American College of Surgeons has furnished one way, imperfect as it admittedly is, to designate the competent and weed out the surgical purchasing agent, and great good has been accomplished in an astonishingly short time. Excepting to the profession itself, however, the College means but little, as the public has by no means grasped its purpose or importance.

So long as no laws exist which prohibit the practice of major surgery and the surgical specialties which deal with fundamental organs like the eye, it is of the greatest importance for the welfare of human-

ity at large that special societies and associations like our own, recognize the heavy load of responsibility which rests upon them, as well as upon their individual members It is our firm conviction that some method should be adopted by which the presentation of bizarre methods of diagnosis, new and startling indications for operative procedures and extreme styles of operating should be withheld from general publication until some degree of uniformity of opinion had been arrived at by those with abundant facilities, and such experience as would keep them from overstepping the bounds of safety for their patients. A satisfactory solution of the problem is difficult.

It would seem that a portion of it lies with medical journals themselves, and that editorial disclaimers of responsibility might well be abolished and editorial comment on the unusual substituted therefor. While editors and editorial writers may have no more knowledge of a subject than the contributor, their views are more likely to be unbiased, and presentation of the opposite viewpoint reveals to the casual reader not only that there is another side, but that it should be heard and weighed before accepting all that even the most advanced research worker or clinician suggests.

It might seem too extreme to suggest that special societies confine the publication of their papers to the official transactions, and certainly such action would serve to smother many valuable ideas at their inception, but it would be quite possible to abolish the practice of publishing the discussions on these papers, and substitute therefor the comments of an editorial committee appointed for that purpose.

All of us recognize that extemporaneous discussion frequently partakes of the character of schoolboy debate, that we always must revise our remarks for publication, and that even the revised version rarely says what we would have said if given sufficient time and space in which to express ourselves.

Such an editorial committee could have at hand a stenographic report of all discussions from which to make a single abstract, giving in the best form the *pros* and *cons* of the ideas advanced by the various speakers as well as the committee's own views, thus making a contribution of real value.

Your retiring President realizes that these suggestions appear a bit radical, but believes that either this or similar action will be found necessary in the not remote future. Believing this, he would like to see this Association demonstrate its courage in pioneering this as it has so many other advances in matters pertaining more especially to its purely professional objects.

By such a trifling innovation the first short step would be taken which in the course of time might lead to others more pronounced in their results. For instance, I think I am well within the truth in

assuming that most of those in this country from whom radical steps in advance may be expected, as well as the majority of conservatives who class themselves as "not the first by whom the new is tried nor yet the last to lay the old aside," will be found in the members of the American Surgical Society, the American Gynecological Society and our own Association.

Probably it is chimerical to suggest that an arrangement might be entered into sometime in the future, by which these and other similar bodies would continue to publish their annual transactions but all in one volume and abolish journal publication altogether, knowing that the results of their work would gradually filter to the general profession through the medium of the organized county and state societies and the American Medical Association, but not until unformulated, unstabilized procedures had been weeded out and nothing but well recognized methods remained. Whether in this or some other manner it is our duty to do all in our power to hamper the incompetent, to assist the worthy who are striving to become efficient and competent, and contribute to the welfare of medicine as a whole by removing from public view such of our professional differences of opinion as are inevitable while we are going forward towards that goal of perfection which always is unattainable but toward which we should nevertheless strive.

Title Insurance Building.

HISTORICAL REVIEW OF THE ORIGIN AND GROWTH OF OUR ASSOCIATION

By Albert Vander Veer, Ph.D., M.D., Albany, N. Y.*

FEW men are permitted the historical pleasure and satisfaction of being in at the formation of a National Association, then to be present at its thirty-fifth anniversary, during this period having seen the necessity of its birth, and the scientific accomplishments of its continued existence. Such is my happiness today, as I recall a meeting held in this city, and after reading the favorable responses from many earnest investigators, and workers in the specialties we represent, determined upon organizing the American Association of Obstetricians and Gynecologists.

The wisdom of associating obstetrical and gynecological subjects has been well demonstrated, as you study anew the contents of the volumes of the Transactions, and note the attitude, at that time, of Mr. Lawson Tait, who was pronouncedly in favor of uniting the lines of work represented in surgical diseases of women, and abdominal surgery, together with obstetrics, as is shown in his early writings and in conversation.

In a paper presented at the Syracuse meeting, in September, 1910, I referred particularly to the origin of the Association, and now, after an existence of thirty-four years, there can be no doubt but that the organization of such a body was along the lines of progress in certain branches of our profession. It has yielded an abundant harvest of good results, and recognized wherever hospitals have been organized, and our profession advanced.

I am greatly comforted in the welcome that is being extended to you by the city where originated our title, and to which you have so fittingly added abdominal surgery, especially as it refers to women. I am convinced that in an association like this, presenting more than one class of cases for discussion, there is obtained a great factor in experience that is transmitted over a wide range of usefulness.

The practice of this additional branch of surgery applies particularly to those men whose work has consisted largely of operations within the abdomen, yet, withal, are general surgeons, and not especially connected with teaching or instruction in obstetrics or gynecology.

For some years before the organization of this association there were many members of our profession seeking postgraduate work,

*The oldest living Fellow of the Association.

not only in this country but abroad, and I trust you will permit me to become just a little reminiscent, in order that I may impress upon some of our Fellows the great advances that have opened the field to them in their beginning successful work.

Just previous to 1860 there was a restless curiosity on the part of the more earnest and intelligent obstetricians to know more about the surgical lesions apparently presenting in their patients. They were aided somewhat by the writings of Grailley Hewitt, Sir James Y. Simpson, of Great Britain, and others, of Germany, and the advanced thinkers of France and America. Yet the teachings offered in such textbooks as West, and Meigs, and the medical journals of that period failed to satisfy this longing, and it was noticeable how many were seeking instruction in the, then developing, specialties.

Upon examining my library, of that period, I can call to mind but one work that impressed me, i.e., "West on Diseases of Women." As I studied it from time to time, and now think of the changes that have occurred, it was certainly a very elementary publication. Not since then can I remember, and, yet, there have been many excellent publications, any work that aroused more earnest study than this volume which I now hold in my hand, and known as "Sim's Uterine Surgery." It awakened a keen interest and commanded immediate attention from our best writers, our ablest lecturers and practitioners, in this, then limited, field. When we come to analyze it dispassionately it gives us much to admire in the employment of that excellent instrument known as "Sim's speculum," and invented by the author. In his reference to incision of the cervix how solemnly it impresses one as we note his fear of hemorrhage and erysipelas. At that time Dr. Sims was in practice in Paris where the latter infection, at certain periods of the year, had full sway in control of hospital wards.

"Sim's Uterine Surgery" was the spark that kindled a new life in the development of the treatment of surgical lesions of the uterus and its appendages. The two great factors that have survived the volume are his "Duck-bill speculum," and position of patient for examination.

There must be very few in our Association at present who have had any practical experience with the sponge, the sea-tangle-laminaria-digitate or tupelo tents that later, with Peaslee and Hanks' dilators, aided much in our reaching the cavity of the uterus for rational surgical treatment.

What a nightmare of anxiety we lived in at that time, in treating retained detritus of an abortion, or retention of portions of the placenta!

Who is there at present who can remember the revolving double-jointed placental forceps?

It is of little interest now, but it adds greatly to the admiration I have for my profession, when I think of those dreadful days when we made use of Thomas' serrated scoop to enucleate a uterine fibroid, or in removing a portion by morcellement, irritating the uterine tissue sufficiently to produce contraction, followed by sloughing, and the odor present for days, even though we used hot douches freely. Some cases did recover and great was the joy of patient, friend, and, sometimes, the surgeon, though he was ever hoping and looking for some treatment more comforting.

My joy in making a clean operation, or removal through the posterior wall of the vagina, and in using the short obstetrical forceps for delivery of uterine fibroids, with the pleasure of having the endorsement of Dr. Sims, as expressed in a personal interview, will never be forgotten.

However, about this time operative methods progressed rapidly, and the septic atmosphere yielded to more intelligent methods.

Tait's removal of the ovaries, for cure of bleeding fibroids, was soon followed by hysterectomy, in one form or another, then pedicle clamps were introduced, all attended with keen anxiety until the patient was well, or fatal septicemia took its share, as it did in all of these progressive efforts in advancing operative surgery.

At one time the elder Keith abandoned all operations, but later he saw, and planned success, by employment of aseptic work.

Peritonitis and pyemia have given me many a restless night, and abscesses in incisions became our constant anxiety.

One of my pleasant remembrances goes back to a visit from Dr. Yandall of Louisville, during this trying decade, who, after examining my abdominal and gynecological cases in the Albany Hospital and private hospital, remarked, "I must congratulate you upon your cases being so free from suppuration, less than I have seen elsewhere."

I cannot describe to you my joy when, after proper sterilization preparatory to the operation, success was attained and laudable pus was prevented.

It must be said Dr. Sims helped greatly in the better understanding of uterine tumors, especially uterine polypi, but he and his associates worked in an atmosphere of constant fear of hemorrhage and infection. Their aim in making a diagnosis went oft astray, and their line of treatment very limited, in the fear of doing the wrong thing.

In looking over my notes at that time, our knowledge in the understandings of surgical lesions of the uterus and appendages was indeed limited.

Is it to be wondered at that we old men look back and rejoice in the progress made since then, and, especially, during the period of the chapter on cellulitis?

At this time electricity, in some form, was much used, and among the relics in my office may be found the remains of several batteries.

Along about this period there developed a greater degree of care in the use of instruments, especially the uterine probe, and likewise care of the surgeon's hands.

Mr. Lister was calling the attention of the profession to micro-organisms, and no one was more observant of progressive work than Dr. Peaslee. As his assistant, my association with him gave me many good points. He always encouraged a neat preparation of self and patient, in office and hospital examinations, and considered it important. This care brought about the reintroduction of the curette, giving the surgeon more confidence and lessening fear and anxiety.

As a result of this research work there developed some few private and special hospitals, and in textbooks on general surgery greater attention was given to diseases of women.

Our own Civil War, and unsettled conditions in Europe, retarded the study of professional research work bearing upon these subjects. Few bacteriological and pathological laboratories were in existence. The one bright spot was the development of the Woman's Hospital of the State of New York, and in which the people here in Albany had much to do, through our State Legislature, in receiving state aid.

Sims, with his silver wire sutures, and the department of gynecology in surgery, were being recognized.

May I make this observation here, that one of the most brilliant operations was the relief of vesicovaginal fistulae. The doing of this operation was my first introduction to this special work, and I am unable to call to mind any one operation in surgery where experience was of so much value. At the present time how seldom are we called upon to perform this operation, largely due to the advanced teachings of the Fellows of the obstetrical branch of our association, regarding the care of the mothers of today. Sims and Emmett wrote freely upon the methods of cure for this lesion, but not so forcibly on the causes.

Scientific pathology and etiology, relating to surgical lesions were being formulated by master minds in our profession. The wave of preventive medicine is yet with us, and demands our earnest endorsement. Much has been accomplished, much more is demanded.

From 1867, to and beyond 1880, I held many autopsies for the senior members of our profession, also for the coroners of Albany County, in public hospitals and other institutions, thus adding much to my knowledge and experience in laboratory and pathological stud-

ies. My attention centered greatly upon the abdominal organs and pathological conditions within the pelvis. I had gathered much from a study of the excellent plates and serious conditions described so fully by Beruntz and Goupil in their pathological anatomy, and I often discussed in my mind, will surgery ever be able to relieve such conditions?

In the early eighties appeared that excellent volume by Thomas Addis Emmett on "The Principles and Practice of Gynecology." In his description of inflammatory conditions within the pelvis, and use of the term "cellulitis" so frequently followed by abscess, there suddenly unfolded to my surgical mind many possibilities of reaching these cases.

Very soon after, and when aseptic surgery, protected by sterilization, came into practice, surgeons approached, by puncture, incision and drainage, these conditions, and, in a large percentage of cases, with excellent results.

This is the point I wish to make: That our Association has a most pronounced, and cheering, record, showing a great determination in cleaning up pus within the abdominal cavity, and, especially, in connection with the appendix and fallopian tubes.

The energy and intelligence with which Dr. Joseph Price followed up this line of operative procedure, has been exceedingly impressive. Any one who desires to review this history of treating the lesions to which I have referred, should consult the earlier volumes of our Transactions.

A rich harvest of progressive work in all branches of surgery now impressed itself upon those then in practice.

Lister was making known his observations upon aseptic surgery, and many new methods of operating were being presented, more especially in the surgical diseases of women. Wells, Thornton, Bantock, Tait, Keith, Savage, and others, in Great Britain, Braun, and his associates, in Germany, and the surgeons of France were rapidly advancing along these lines, while in our own country Peaslee, Thomas, and a host of other workers, were accomplishing wonderful results, but, notwithstanding all this, there were yet many disappointments.

Succeeding years sifted out the uncertainties, and research work, giving a better understanding of pathological microorganisms, lessened the fear of septic infection and suppuration.

From the first half of the eighties began in earnest the organizations of special hospitals, and the construction of our better general hospitals and maternities.

The period of full fruition in aseptic surgery seemed to exhaust the ingenuity of the surgeons and gynecologists in the treatment of misplacements of the uterus, and flexions and lesions. My array of

left-over pessaries is, to me, a chapter of sadness and, I must admit, disappointment. As I look back upon that period it presents a cycle of suffering women, with probe, cellulitis, abscess, operation, drainage, etc. At one time my notes revealed six cases under treatment, of which one was in my own practice.

Even before the streptococci were facing the physician and surgeon, many of us were protesting against the employment of the probe, and instrumental replacement of the uterus. The one encouraging factor was Dr. Emmett's recognition of laceration of the cervix, and its method of repair.

It is past history now but we owe to Mr. Lister, Sir Joseph Lister, Lord Lister, and coworkers, a never-to-be-forgotten debt for the advances made in avoidance of pus in the treatment of surgical lesions in women.

Tabulating the work of our Association I find on a somewhat careful comparison of the decades ending in 1898, 1908, 1918, and the years 1919 and 1920, that there have been presented 1236 papers, and of these it is rather remarkable that obstetrics and gynecology each claim 410, while abdominal surgery has 416. It must be stated, however, that there are a few papers that do not belong in the work of our Association, and have an exceedingly slight claim to be classified with abdominal surgery.

I note on our present program a paper on "Tumors of the Breast." At first sight we might say it does not belong to this Association, and, yet, there is much for the obstetrician to keep in mind, when complications of this gland present in his lying-in patients; that a correct treatment saves the patient from dangers of after lesions that may call for the care of the general surgeon. Like lacerations of the cervix, scar tissues, or neglected cases of abscess, become a factor in the etiology of cancer of the female breast.

There are many problems to be solved. Our uncertain knowledge of cancer remains with us, although there are many lines of treatment suggested. Let us endeavor to employ the best, and endorse such channels of investigation as are now being pursued.

Tubercular conditions call for further positive, early diagnosis and treatment.

I have an impression that as pathological specimens become less in number, showing extensive destruction of organs, and that other early operations show the beginning of changes that are now arrested by prompt operative intervention, such exhibits should be presented more freely for earnest discussion at our meetings.

I would call the attention of the Division in Obstetrics to the present statistics among lying-in patients. Deaths from puerperal septicemia, and other puerperal causes throughout the United States,

both in cities and the country, are yet too numerous. I would also call attention to the significance of the important factors in the introduction, in Congress, of such bills as the Sheppard-Towner bill.

This did not receive the approval of Governor Miller, of New York State, but instead he endorsed the bill known as the Senator Davenport Act, which gives the state authority to continue investigations and approve methods for lessening the percentage of deaths, also to promote maternal and child hygiene instruction. The state appropriated $130,000 for this new division, and Dr. Biggs, New York State Commissioner of Health, states that health surveys have been made and organization developed on a county basis. Prominent obstetricians and gynecologists have been invited to act as consultants, thirteen regional physicians already having accepted. The Health Department is conducting an educational campaign through the medium of the newspapers, pamphlets, slides, films and lectures. An important branch is the compilation of maternal and infant mortality, thus obtaining definite information in each locality as to the causes of death.

Assistance in loaning nurses has been organized, and women's clubs, etc., asked to cooperate in this work. Seemingly few mothers have any real instruction in the hygiene of maternity. Governor Miller wisely stated that "welfare work must reach down to the individual to be helped; that we must go where the mothers and babies are, but not through a national campaign."

Can all mothers receive prenatal care? Are our midwives licensed and inspected? Do we have medical school inspection as to prenatal life?

These are important questions, and it would seem that our Association might afford some assistance in their solution.

The census shows that every age group has decreased in death rate for the last decade. The Department of Commerce, through the Bureau of Census, has issued a statement showing deaths, and death rates, by age groups, from different causes, in 1910 and 1920. In every group the death rate was lower in 1920 than in 1910. On the other hand there were increases in the rate from influenza, cancer and puerperal causes, which clearly show some of the danger spots, and of these the last two are the most pronounced.

In these investigations we have great reason to be encouraged over the report presented by the Chairman of the Committee on Maternity Welfare, appointed at the St. Louis meeting in 1921.

Let me emphasize, that in our efforts to benefit our patients who suffer from inoperable malignancy, we ought always to keep in mind the possibility of temporary relief through some form of surgical

procedure, and not tire of further experimental use of the x-ray and radium.

In palliative operations upon the stomach and intestinal tract, I can but endorse my own experience, and that of other surgeons, i.e., that the lives of these patients are often prolonged and their living made quite comfortable.

May I be permitted to offer my endorsement of requiring an essay from each applicant, and that great care be exercised in electing to Fellowship only such as are real workers in one of the three specialties.

That a rigid enforcement of the resolution calling for a thesis on the part of applicants seeking Fellowship, should be carried out in full faith.

That appointing an orator for each meeting, in order to give the Association an up-to-date résumé of what is being advanced in its three specialties, is to be commended.

In closing let me say of the original Founders, forty in all, few are living. It would be impossible for me to speak of the individual merits of our deceased associates. I feel it my duty to refer to one who attended the initial meeting and, as Chairman of the Committee on the Seal, gave us the impressive one as it appears in our annual volumes. Dr. Franklin Townsend, Jr., of Albany, died in the early years of a successful practice, having entered upon a career of study and investigation that promised much. It is proper to note that his widow is in attendance at this meeting.

It is with great sadness that I personally express my appreciation of the earnest assistance rendered by Dr. X. O. Werder, who, for so many years, acted as our treasurer.

It is but natural for me to think that this may be the last paper I will prepare for the Association, so dear to my heart, and I wish to say there are two men, who, for their loyalty, and excellent service rendered, deserve our gratitude. These are our late secretaries, Drs. W. W. Potter, and E. Gustav Zinke. Of the former the Association has ever felt the earnestness with which he labored at the meetings, and in the intervals, for its recognition and success. Few could equal Dr. Potter as an organizer and executive officer.

Of the latter how full of enthusiasm and loyalty was Dr. Zinke's letter of October 7th, 1920, referring to the Atlantic City meeting, and what could be more touching and affectionate than his last letter of January 27, 1922, addressing it to "My Dear Fellows"!

DRY LABOR

By John Osborn Polak, M.D., F.A.C.S., Brooklyn, N. Y.

DRY labor, its proper conduct and its successful issue, brings up for discussion a subject that must have given every conscientious obstetrician hours of worry. That we may have a clearer understanding of some of the fundamentals involved I am going to discuss the subject from a clinical standpoint, based on active obstetric experience of over twenty-five years, under the following headings:

1. When rupture of the membranes occurs, with unprepared soft parts, before labor begins, in primiparae or multiparae, the pelvis and child being relatively normal.

2. When the membranes rupture at the beginning of labor with the cervix undilated; head or breech engaged or engageable; the pelvis presumably normal.

3. Dry labor with undilated cervix in the minor degrees of relative disproportion, where under ordinary circumstances with membranes intact, we would give the woman a full test of labor.

Dry labor makes delivery more serious for both the mother and the fetus, this is especially so in primiparae by exposing the mother to more prolonged effort, general and uterine exhaustion, greater trauma, the greater possibility of operative interference and infection, and finally to the increased possibility of hemorrhage in the third stage and a slower convalescence.

The fetal mortality is definitely increased from the continuous pressure on the presenting part, resulting in greater moulding, cerebral congestion, operative injury, interference with the feto-placental circulation and fetal infection through the placenta and cord as demonstrated by Slemons, DeLee and Beach. It is therefore evident that early rupture of the membrane may be a serious complication for it always prolongs labor and subjects the participants to greater danger.

The undilated cervix offers the primary obstruction, exciting the uterine muscle to reflex irritability and therefore presents the chief subject of this discussion.

All authorities are agreed that physiologic dilatation of the soft parts is best; yet in dry labor we are robbed of the mechanical advantage of the hydrostatic action of the fore-waters, which normally soften and open the cervical canal. Hence the cervix being unsupported and having its return circulation blocked becomes markedly

edematous and unyielding, exciting spasmodic but powerless uterine contractions which mould the uterus upon the contained fetus and form a contraction ring just above the site of the internal os.

Have we any substitutes for the absence of hydrostatic dilatation, and if we have where do they fail, and if they succeed what is the added risk? It is a fundamental principle that the cervix must be open before the baby can come out, an axiom which is daily violated by the practitioner, yet it allows of no argument. How then can we attain this dilatation? This question is at once answered: (a) by the use of the dilating bag; (b) by manual dilation under anesthesia; (c) by time and morphine analgesia; (d) by the colpeurynter; (e) by the properly applied vaginal pack; (f) by surgical incision. But all of these several solutions have their disadvantages and dangers, and often fail to give the desired dilatation in time to allow the passage of a living child without extensive trauma to the mother's soft parts.

The bag is uncertain, it displaces the presenting part and may allow prolapse of the cord and is apt to cause the formation of a retraction ring just above the bag. According to Dorman it results in operative termination in over half of the cases and increases the dangers of sepsis as it is applied to the inside of the cervix and every abrasion, however small, is drained by the cervical lymphatics and excites a parametrial reaction for the bag dams back the secretions.

Manual dilatation might better be described as manual laceration for there never was a cervix manually dilated in which a laceration of some degree could not be demonstrated; furthermore, delivery after manual dilatation must always be accomplished by some operative measure which further increases the trauma.

Beck in a recent paper based on the study of clinic cases has shown what can be done by time and morphine. This report is worthy of consideration, yet it leaves a number of cases to the field of operative procedure.

The vaginal bag or colpeurynter against the cervix has had little recognition in this country in recent years; yet personal experience has made me feel it deserves further trial. Its advantage over the intracervical bag is that when we place a bag of sufficient size within the uterus, to iron out the cervix, the presenting part is dislodged and a retraction ring is formed just above the upper margin of the bag which prevents descent of the presenting part; the vaginal bag, on the other hand, while it raises the presenting part, does compress the cervix between the bag and advancing part, thus thinning and softening the margin of the cervical rim.

Plugging the vagina with sterile moist cotton or gauze when properly done has many advantages over the bag, for with the patient in the Sims position and the perineum retracted with a Sims speculum, it may be accurately applied so that it fills every part of the vagina; it may be applied against the cervix so accurately that equilateral pressure is made on every portion of the cervical rim which is thinned out between the advancing head and the vaginal plug. The gauze or boiled cotton batting should be moistened with a solution of sterile boroglyceride which prevents abrasions of the soft parts and softens the tissues.

Dürrhsens' incisions presuppose an effaced cervix and thoroughly meet the surgical requirement, but clinically the extent of the incision is difficult to limit; suture is not always successful and a pathology which may need subsequent operation is frequently a result.

With this brief consideration of the difficulties which result from soft part dystocia in dry labor and a recital of the several methods employed for its relief, I will now take up the discussion of this application and our management of illustrative cases under the three headings stated at the beginning which may be briefly summarized as follows:

In the first class, where rupture of the membranes has occurred before labor begins, with unprepared soft parts, with the head in the brim, and the head and pelvis presumably normal, experience has taught us to let the patient absolutely alone, for neither child nor mother suffers any injury from ruptured membranes, so long as the woman is not in active labor and the cervix is not infected by repeated vaginal examinations or manipulation. The ball valve action of the head more or less effectively blocks the egress of fluid and retains a considerable portion of the amniotic liquid. Spontaneous labor will usually occur in due time and should be well established before any adjunct to favor dilatation need be considered.

Only in old primiparae where the value of the child is of paramount importance from a legal standpoint, can it be conceived in the light of an extended experience that surgical interference is justifiable.

In the second class, labor should be allowed to progress for several hours or until the pains are strong and regular before resorting to measures which will aid in the dilatation of the cervix; then a careful examination should determine the condition of the cervix and the progress of labor. If the cervix is thinned out, even though the external os is no larger than 2 or 3 cm., morphine, scopolamin and time alone will almost always effect complete dilatation. On the other hand, if the cervical rim is thick and unyielding, the patient

after proper surgical preparation of the vulvar orifice should be placed in the Sims position, the perineum retracted with a Sims speculum, and the vagina packed with boiled cotton batting moistened and wrung out in a weak solution of boroglyceride, one part to eight of sterile water. The tampon should be closely applied to the fornices and over the stretched cervix, and the vagina firmly packed. This excites uterine contractions, keeps the cervix in close apposition to the presenting part, softens it and irons out the canal. A hypodermic of morphine, gr. ¼, and scopolamin, gr. 1/100, at the completion of the packing acts as a valuable adjunct by giving the patient rest between pains and apparently relaxing the cervical spasm. In a few hours dilatation is completed, the plug is expelled and the presenting part pushed down to the pelvic floor.

Nothing new is claimed for this method except the addition of the boroglyceride. Plugging has been used in the Rotunda for years, but has fallen into disuse in this country, probably owing to the fact that unless it is done properly the results are variable.

Long experience has convinced me that all the other methods of artificially dilating the cervix are inferior and are fraught with greater danger. Dilatation is secured without trauma and the secretions are not dammed up behind the plug as is the case with the bag.

In the third class where some relative disproportion between the head and the pelvis obtains, complicated with dry labor, too much time must not be wasted on the management of the soft part dystocia, for the child's chances are lessened materially in this class by a prolonged and ineffectual test, owing to the interference with the fetoplacental circulation and the cerebral pressure. More than twelve hours of labor should not be permitted if progressive advance is not demonstrated; for the dangers from sepsis are constantly increasing and late operations are attended with high mortality. It is in this class that section deserves consideration.

Abdominal delivery in dry labor, however, is always a serious undertaking; for statistical studies have shown that both the maternal morbidity and mortality in section are directly increased as the length of the labor is prolonged, and both are higher if the membranes have ruptured. In my report recently published on the mortality in 2200 cesarean operations, which included the work of some of the obstetric masters, the mortality ranged between 6 and 14 per cent in women who had been in labor for periods of over 12 hours. The morbidity seemed to depend not only on the absence of the membranes but upon the number of vaginal examinations made after the membranes had been ruptured; hence it will be seen that the case with ruptured membranes must be considered as potentially infected. This is explained by the fact that the interior of the uterus and the placen-

tal site are exposed in dry labor to infection from the vagina. Again dry labor is always prolonged, section on a tired uterus is often attended with greater blood loss from uterine atony and this further reduces the individual resistance.

When the classical section is done late in labor, where the membranes are ruptured, two clinical dangers must be counteracted as far as possible, namely: uterine relaxation and the infection of the uterine wound. To meet these dangers to the woman, the vagina should be thoroughly iodized before operating, and after the placenta has been removed the interior of the uterus should be firmly packed through the hysterotomy wound with iodoform gauze to stimulate uterine contraction. The pack is allowed to remain *in situ*, to be expelled by uterine contractions. This occludes the uterine sinuses for it is acknowledged that a relaxed uterus opens a way to sepsis and conversely a contracted uterus is the best barrier against infective invasion. When we realize that streptococci can be demonstrated in the interior of the uterus in over 60 per cent of normal puerperae on the fifth or sixth day, or just at the time when the uterine wound, if there is any defection in suture or asepsis, can be inoculated by the cocci and infection extended from the interior of the uterus to the peritoneum, it is a wonder that even a larger percentage of sections do not end fatally. It is because of this clinical knowledge that efforts have been made to perfect the transperitoneal and extraperitoneal methods of uterine exclusion in performing section.

Krönig, Hirst, Beck, Frank and Latzo have all perfected procedures with the idea of protecting the peritoneum against extension of infection from the inside of the uterus through the hysterotomy wound. Their methods do not save the frankly infected case, therefore it behooves us in dealing with the border-line cases of dry labor in which the membranes are ruptured, to conduct such labor with the greatest asepsis and without vaginal examinations, using only abdominal examination and the rectal touch to determine the degree of dilatation of the cervix and the descent of the presenting part.

In conclusion I would urge: 1, that all cases of dry labor will fall within one of three classes, already described; 2, that it must be admitted that each case of dry labor should be considered on its individual merits; 3, that the determining factors in selection of method are the position of the presenting part, the length of the labor and the condition of the cervix; 4, that where infravaginal delivery is possible that cervical dilatation is best handled with morphine and vaginal plugging, and finally, 5, when section is elected, owing to the fact that all dry labors are potentially infected, the classical operation is not the one of choice, but we should select one that excludes the peritoneal infection by peritoneal flaps.

20 Livingston Street.

DISCUSSION

DR. GRANDISON D. ROYSTON, St. Louis, Missouri.—I would like to ask Dr. Polak whether he has ever known a child to die during labor before the membranes had been ruptured, where no meddlesome interference had been practiced.

I was glad to hear him say that he makes use of morphine and scopolamine in these cases. We have been doing that for seven years and the fetal mortality among our last thousand private cases was seven-eighths of one per cent. We give only a single dose of one-sixth grain of morphine instead of one-quarter grain and do not repeat. We do not administer it in cases of inertia and rarely in cases of premature labor, because a premature child stands morphine badly. We have not found that hyoscine or scopolamine in moderate dosage had any appreciably ill effect upon the mother or child.

DR. WILLIAM D. PORTER, Cincinnati, Ohio.—Dr. Polak's objections to manual dilatation are well taken. Complete manual dilatation is a physical impossibility, even if the cervix is not torn. His objection to the hydrostatic bags is, I think, well taken, if he uses a bag reenforced with unyielding material, such as the Champetier de Ribes bag and some of the others. However, there is a bag which I always use, namely, the Braun bag, which is balloon shape, made of soft rubber which dilates equally in all directions and expands without any restriction as to shape. That bag will produce dilatation without the objectionable features the essayist mentioned.

As to the use of boroglyceride, I am skeptical. In the first place, it is an objectionable procedure to be used by the general practitioner. In the second place, glycerin acts simply by abstracting water from the tissues. If you have a condition in which the membranes are ruptured you would have that action neutralized before it has any particular effect.

I believe a general criticism might perhaps be made of the paper to the effect that the dangers of dry labor are rather exaggerated. In my experience the dangers mentioned do not develop, as a rule, and to say that a woman should not be allowed to be in labor more than 12 hours in these cases seems an extreme state ment.

DR. JAMES K. QUIGLEY, Rochester, New York.—I would like to ask Dr. Polak as to the percentage of iodoform in the packing, and about the average time it is expelled?

DR. JAMES E. DAVIS, Detroit, Michigan.—The author emphasizes the importance of considering the resistance of the patient. In this connection I want to refer to the finding of streptococci in such a large proportion of cases. I do not think the author means that under ordinary circumstances the finding of these organisms has any significance except that the patient's resistance is lowered.

It would be interesting to have Dr. Polak describe the types of streptococci that were found, and also whether mutation may occur in these organisms under the conditions that prevail in the cervix and during labor.

DR. MAGNUS A. TATE, Cincinnati, Ohio.—It is most interesting to examine, as I have done, hundreds of women after they have been confined, in order to see the condition of the cervix. It is most unusual to find a cervix which has not been torn in the normal or abnormal cases. They are all torn to some extent.

There is one thing that I probably at this time stand alone in, in this Association, and that is, in manual dilatation of the cervix in certain cases. If we take a case where the os is effaced, with a thin dilatable cervix, such a cervix can be slowly, easily and readily dilated without a tear. I have done this many times, and have yet to see any damage or danger in such manipulation. I grant that we should not attempt manual dilatation in every case. That would be foolish, foolhardy and meddlesome obstetrics.

DR. A. M. MENDENHALL, INDIANAPOLIS, INDIANA.—A patient whose membranes have ruptured and who is not in labor should be most thoroughly guarded against any possible infection. In other words, I would have such a woman go to the hospital, be properly prepared for future delivery and be given the proper sort of trial, resorting to every precaution to guard against infection.

DR. POLAK (closing).—I want to answer Dr. Mendenhall's question first and go backward. In the first case, where rupture of the membranes has occurred before labor begins, with unprepared soft parts, with the head in the brim, and the head and pelvis presumably normal, my experience is to let the patient absolutely alone. Neither the child nor the mother suffers any injury from rupture of the membranes so long as the woman is not in active labor; she is kept under proper observation, and the cervix is not infected by repeated examinations; in other words, these patients should be under observation in the hospital but are let alone. I have seen several babies die before the woman has fallen into labor, but I have seen so many hundreds delivered without any trouble, that I feel the two cases that stand out in my memory very distinctly are these, one that occurred a month ago and one six years ago. As to the case of six years ago, the woman has never been pregnant since; that stands out in my memory very definitely, and fetal death occurred before the woman started in labor. Examination of the placenta showed the cause in both of these cases. There were old changes in the placenta, not new ones.

In regard to the gauze left in the uterus, I personally have never had to pull it out. Potter, of Buffalo, assured me recently that in all of his experience he had never to pull it out; it is expelled at the end of about twenty-four hours; sometimes it will remain, as it did in one of my cases, thirty-six hours before it was expelled, and it maintained the firmly contracted uterus just as the uterine packing does. In that way it does the two things, it prevents the extra hemorrhage which these women have, and in the second place, it causes contraction at the placental site and defends the woman against the invasion of vaginal bacteria that are bound to migrate into the uterus.

In regard to the vaginal pack, it is the old pack that we have used now for nearly thirty years in every case where the membranes were ruptured. We do not do that now. We resort to packing of the vagina where there is a rigid os, where the cervix is thickened from nonsupport, where others would either use morphine, or bags, or manual dilatation. If we could teach the practitioner to boil his gauze and use sterile boroglyceride solution, which reduces edema, he would get better results. If we pack the vagina firmly, it is expelled as the baby pushes it down. Our rule used to be that when the pack was pushed out to send for the doctor, and if the head was down fully on the pelvic floor he would put on the forceps.

In regard to one other question, there is an impression that I said that when any woman remained for twelve hours in labor she should have interference. There was a third class of cases with the membranes ruptured, where there was a slight disproportion between the head and the pelvis, with undilated cervix, and under ordinary circumstances we would permit the woman to have the full test of labor with the membranes intact. That woman, if she did not show advance in twelve hours of active labor, needed the greatest of obstetric care, because cervical dystocia in that type of case results in dead children. Although I saw the Braum bag used in Vienna a number of times, I have never used it.

In regard to manual dilatation, Dr. Tate said I made the statement that every cervix was lacerated during labor, and consequently you feel that if you lacerate it more, it does not hurt. But we do want to minimize these things, and when the cervix is obliterated with the os changed under anesthesia, if we get that cervix up to dilatation of the full hand or more, I believe you will increase the trauma.

TWIN TUBAL PREGNANCY

By Wm. Edgar Darnall, M.D., F.A.C.S., Atlantic City, N. J.

TUBAL or ectopic pregnancy, formerly thought to be rather unusual, is now common enough to be uninteresting but the extreme rarity of the occurrence of twins in the same tube is worth reporting because of its infrequent occurrence. Twin tubal pregnancies are divided into two classes, those in which there are two fetuses in one tube and those in which there is a separate fetus in each tube.

Mrs. P. H., age twenty-eight, weight 185, a well developed colored woman, was referred in to the hospital by a local physician. She had been complaining of a dull aching in the pelvis and an occasional sharp pain and severe backaches. She had had no children but had had two miscarriages. Her blood and urine were approximately normal and the Wassermann test was negative. She began to menstruate at 12 years of age. Her periods were regular twenty-eight-day type with no pain and lasting 4 to 5 days. She had passed her last period, being about a month overdue. She had a brownish, but not very profuse discharge.

On examination she was very tender over the right side and the pelvis was filled with a mass of nodular fibroids and cysts of both ovaries.

On opening the abdomen she presented a mass of multiple fibromyomata of various sizes, cysts of both ovaries, a large left pyosalpinx and an equally large right tube, all agglutinated together in one mass with extensive adhesions. There was no free blood in the abdomen, and no rupture. A supravaginal hysterectomy was done. On account of the bluish color of the right tube it was opened. It presented the usual blood clot, membranes intact and two fetuses back to belly, spoon-fashion. The age of the fetuses was estimated to be between five and six weeks. There was but one placenta but there were two cords. It is difficult to understand how any woman with the extensive pathology exhibited in this case, affecting tubes, ovaries and uterus could possibly become impregnated under any circumstances. However, her recovery was normal and uneventful.

In reviewing the literature, Pool and Robbins[1] report up to 1910 twenty-nine authentic cases with more or less complete data on each. They also mention the findings of Pulcher, McCalla, Schauta and Costa who together reported seventy-three cases considered authentic. J. F. Baldwin,[2] 1913, reported a case that had been diagnosed as procidentia. Upon opening the abdomen there was found a twin pregnancy of one tube and a single embryo in the opposite tube. The fetuses were very early, being little larger than peas.

Noel Braham,[4] 1914, reported a case in which there was a fetus in one tube and a second fetus extruding from the fimbriated end of the same tube. The patient gave a history of six months' pregnancy but the fetuses measured only seven inches in length.

Gordon Taylor,[3] in 1918, operated on a patient suffering from ruptured ectopic pregnancy. The rupture was intraligamentous. He

found one complete embryo and the head and shoulders of another but the balance of the second fetus was lost in the blood clot. It had no connection with the first and there is no description of the placenta or the arrangement of the cords.

The case of J. H. Carstens,[6] 1919, is rather unique. There was a diagnosis of tubal pregnancy. At operation there was a tubal abortion of the right tube and the culdesac was full of blood, containing about four ounces, but he made no mention of having seen the fetus. The left tube was not ruptured but on opening it he found therein two fetuses each about three-quarters of an inch in length. He makes no mention of whether there were single or double placentae or single or double cords. He estimated the age of the right tubal fetus as six weeks and the left tubal twins as three weeks.

Max Thorek,[5] 1921, reports a case in which the right tube was normal, the uterus enlarged and soft and the left tube enormously distended and ruptured. The fetuses which it had contained were lying free in the abdominal cavity. The specimen showed two male fetuses of about four months' duration attached to a common placenta. Other cases of interest include one reported by Treube[7] in which there were five embryos in one tube of three or four months' development. Saenger,[8] Barbat[9] and Wilmer Krusen[10] have each reported the occurrence of a triple tubal gestation of one tube. The cases of Baldwin and Carstens were instances of bilateral tubal pregnancy.

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8 South Morris Avenue.

DISCUSSION

DR. JAMES F. BALDWIN, Columbus, Ohio.—With reference to the case of multiple pregnancy referred to by the essayist, I can only state that I reported the case several years ago in the Journal of the American Medical Association. At the time of the operation there had been no suspicion at all that the patient was pregnant. At the operation three curious lumps were noticed, about like average peas, two in one tube and one in the other. The specimens were turned over to the hospital pathologist and in due time he reported that it was a case of triple pregnancy.

FEMALE MAMMAE IN RELATION WITH THE PELVIC ORGANS

By David Hadden, M.D., Oakland, Calif.

In *Surgery, Gynecology and Obstetrics* for December, 1921, there appeared an article by Keyser of Rochester, Minnesota, on "Massive Hypertrophy of the Breast." Some four cases that came under the author's observation were quoted, but in only one was any reference made to the menstrual history following the operation, and cessation of menstruation is noted in that case.

I am taking this opportunity to report one case of bilateral breast removal done for a fibroepithelial type of mammary hypertrophy with the idea of adding it to the recorded group, and also as a basis for discussion of the effect of breast removal upon the physiologic functions of the other reproductive organs.

Bilateral breast amputations are comparatively rare as there are not many conditions involving both breasts, requiring surgical procedures. So far in my own experience I have only had two such cases and in the few others that came to my attention there was no opportunity to obtain any subsequent history.

Case 1.—Miss D. H., age twenty-one years, had excessively large mammae that began to hypertrophy at the time of puberty, at the age of 13 years. She presented no pathologic symptoms except somewhat profuse menstruation at rather irregular intervals. The breasts gave discomfort because of excessive weight and markedly increased size during menstruation. At the age of seventeen she had a ruptured appendix with operation and drainage and as an aftermath a displaced uterus and omental adhesions. When she returned to Oakland a year later I found the breasts more markedly enlarged than when I first saw her as a girl of sixteen. Her periods were still excessive and painful because of the pelvic complications. Shortly thereafter I corrected the abdominal and pelvic pathology and did a double breast amputation because the physical discomfort and physical defect resulted in difficulty in obtaining occupation.

Rather to my surprise the menstrual function while painless was markedly suppressed following operation and continued so. The flow was very scant with excessive clotting and later, again associated with pain, though pelvically the patient was normal and the constipation from the previous adhesions had cleared up. I put her on mammary extract with an immediate amelioration of all menstrual distress and the establishment of a normal flow which remains normal provided the mammary extract is taken for a few days preceding the periods.

Case 2 served further to emphasize in my mind the relation of the mammary secretions to menstruation. An unmarried woman of 40 who had a double cystic mastitis, developed nodules which were more definitely indurated in the right side. Section showed a beginning malignancy confined to the primary site. In view, however, of the left mamma being more definitely cystic I did a double amputation. In this case also the menstrual function has undergone the same suppression.

In view of the fact that for a number of years I have been using mammary extract for small fibroids of the uterus with very definite reduction in the size of the growth and relief of the associated excessive menstruation and in a number of cases clinical cures, I rather expected to find if the mammae were removed an increase rather than a decrease in menstrual flow.

The physiologic changes in the breasts during pregnancy with the normal amenorrhea of lactation led me to argue the same way. The reversal of findings in these two cases has therefore been rather a surprise.

Oakland Bank Savings Building.

SYMPTOMS AND SIGNS OF EXTRAUTERINE PREGNANCY AT OR NEAR TERM WITH REPORT OF TWO CASES AND THE TREATMENT OF LATE ECTOPIC GESTATION, TOGETHER WITH A REVIEW OF THE LITERATURE AND RECORDED CASES

By Herman E. Hayd, M.D., F.A.C.S., M.R.C.S.Mg., and Irving W. Potter, M.D., F.A.C.S., Buffalo, New York

THE Transactions of this Society go back to 1888 and represent, as well as any other publications in the world, the activities and progress in this special and chosen field of work.

In the early volumes, no subject received so much attention as extrauterine pregnancy; in fact, the very first issue contains a symposium and each succeeding volume for a number of years contains from one to three or more papers on this important condition. The most interesting part in the discussion is in the retrospect, in estimating the advances that have been made in modern surgery since that period, to compare the bold incisions of the modern surgeon and his confidence in his technic with the small incisions and its limited field for orientation, the fear and timidity of the operator in invading the peritoneal cavity, to note the careful advice given as to how the fingers should be placed in approaching and separating adhesions and other academic questions, which the merest tyro in the surgery of today is thoroughly familiar with, and yet, the pathology and symptomatology of late extrauterine pregnancy was as well dealt with in those papers as we would deal with them today.

And why; because few men have had an opportunity of seeing cases of extrauterine pregnancy at term where the ovum had sustained the insults of early rupture and later, perhaps, secondary rupture of the sac and then had gone on developing to maturity. The symptomatology leaves room for further elucidation and more elaboration of the few features of value, which I saw during one year in Dr. Potter's practice and which suggested this paper.

We have all dealt with many cases of early rupture, in fact, up to the fourth or fifth month, but few of us have ever operated any of these cases at term with a living baby and wherein a positive diagnosis of the condition was made before operation. Many of us have operated and have reported cases wherein the baby had gone on to term and died and was removed as a mummified or calcareous product. However, obstetrical and gynecological literature contains

a history of quite a number of cases wherein a viable baby was removed at or about term and lived and did well for months and years.

A tube can rupture and the oval sac remain unbroken, but usually, when the tube does rupture, the sac is also broken and consequently, the ovum dies. Therefore, in order to have a progressive development of the embryo, it is necessary to have a sac unbroken and a maternal attachment, the site of which will depend upon the spot where the ovum happens to locate itself, and this gives rise to the various forms of late tubal pregnancies. First, and perhaps the most frequent variety, is where the tube ruptures on its under surface into and between the folds of the broad ligaments, the hemorrhage which is usually not great, is controlled in this resisting locality, the free blood is absorbed and a placental connection takes place, and the embryo goes on developing to maturity, when it is delivered by abdominal section or it dies and goes through the various pathologic changes of "adipoceration, skeletonization or calcareous transformation" or suppuration and evacuation into the bowels, bladder or other avenues of exit. Second, where the embryo is located at the isthmus or ampullar end of the tube and where the ostium or fimbriae remain firmly closed and where the embryo can go on developing to maturity without the tube rupturing, resulting in a true tubal gestation; or third, where the tube breaks and the product falls into the abdominal cavity, producing an abdominal variety, the placental attachment being in the tube or partly in the tube or on the abdominal viscera. A fourth variety is where the fertilized ovum develops in the ovary itself in the graafian follicle at the point of rupture, making that very rare form, a true ovarian pregnancy; or it may develop partly in the ovary and tube as a tuboovarian variety. No doubt, it is the location of the mature baby which is responsible for the difficulties at the time of operation; if it develops in the tube or ovary, perhaps the whole mass can be clamped off and removed, but if it has grown in the abdominal cavity and formed strong attachments to bowels and viscera, it would be impossible to enucleate it without a fatal hemorrhage and even if it grew between the folds of the broad ligament, the difficulties in its removal would be very great indeed.

Let me give the history of these two cases and then I shall endeavor to amplify the prominent signs as they appeared to me irrespective of the classic descriptions as given by other writers on this subject.

Case 1.—E. B., age thirty-five, mother of two children, twelve and two years of age. Had one miscarriage before the birth of her first baby.

I saw her in consultation on April 21, 1921. She was up and about doing her work as usual the day before she was taken sick, in fact she went out. On returning home she complained of so much pain that she visited a neighboring doctor and the next day Dr. McDowell sent her to the Homeopathic Hospital, where I

saw her, with him, in the afternoon. The condition was one of extreme gravity, pulse 140, temperature 100°, she was vomiting a greenish brown fluid, and was very tender upon pressure over the abdomen, especially on the left side. There was distention and she had not passed any gas since early morning. The stomach was washed and found to contain a large amount of a greenish brown fluid. One fourth grain of morphine was given at once, to be repeated in one-eighth grain doses as required. Then tap water slowly was introduced into the bowel by the Murphy drip as long as it could be tolerated. On the following morning the patient was passing flatus freely, the vomiting had ceased and the improvement in her general condition was very marked indeed. The baby lay well out on the left side and the heart sounds were distinctly heard, but there was no uterine souffle or placental bruit, and upon vaginal examination the cervix was high up, quite hard and the os was pointed in outline but not soft, large and patulous as one would expect it to be at this period of gestation; and a hard body, the size of one's fist, could be felt a little to the right between the baby and the examining finger. She was now quite anxious to answer my questions and she told me she was about eight and a half months advanced. She had felt well during her gestation period, although at first had suffered more pains in the lower abdomen than in her other pregnancies and had seen a little blood occasionally but not enough to make her think she was menstruating and from her nausea and other symptoms she knew she was pregnant. A diagnosis was made of partial obstruction of the bowels with pregnancy complicated by a fibroid tumor low down in the pelvis.

Dr. Potter was out of the city and when he returned, in a few days, I turned the case over to him and as her condition was so much improved, he felt we might wait a short time before interfering. However, in two days, Dr. Potter called me and said the woman had suddenly taken a bad turn and when I saw her, with him, at five P. M., I felt that an operation was out of the question, and she died at eight P.M. that evening. On looking over the report of the pathologist, Dr. Thibaudeau, one can easily explain and correlate our symptoms with the pathology as evidenced at the postmortem. The mass consisted of the tube, which contained a baby weighing six and a half pounds, well formed and perfectly developed and evidently dead but a few days. The mass could be pretty well lifted up and the bowels, although quite adherent at different points, might have been easily separated and the whole product clamped off at both ends, tied and delivered. The woman evidently had been in spurious labor, which thinned out and weakened the wall of the sac, because a rent was present, about two or three inches in length, in the thin, distended part of the tube and quite a lot of blood clots and fluid, no doubt liquor amnii, were present in the peritoneal cavity. When Dr. Potter first saw the case he heard no fetal heart sounds and therefore questioned my diagnosis. The baby, no doubt, had died sometime during the two days I saw her, and the sudden collapse of the woman while under Dr. Potter's care is explained by the breaking of the sac wall and the sudden flow of liquor amnii and blood into the peritoneal cavity.

The following is the report of Dr. Potter's second case. I saw this woman for the first time three weeks after operation.

Case 2.—Mrs. B. M., age thirty-eight, one child eleven years old. One miscarriage occurred two years after her first baby was born. She was always regular and had little or no pain at her periods.

About six weeks after having missed her menstrual period her regular doctor saw her, when she passed a small mass which appeared to be made up of blood and some fibrinous material, there was little pain and no shock, and an examination of the

specimen disclosed a clot of blood and decidual membrane. In the course of a few days she got up and attended to her usual household duties. She had felt well up to about seven and a half months, when she had an attack of vomiting and began to suffer agonizing pains, especially in the left side and back and was distended with gas and had obstinate constipation. In a few days these symptoms became alarming, a general surgeon was called, and a diagnosis was made of partial obstruction of the bowels, complicating pregnancy. Under appropriate treatment she improved somewhat, but the pains continued, and after five weeks, she was sent to the Deaconess Hospital, where Doctor Potter saw her. One week later, he opened the abdomen, expecting to perform a caesarean section under the diagnosis of a fibroid tumor, complicating pregnancy; but, after the abdomen was opened, he at once saw that he had an extrauterine fetation in the right tube, and the uterus was about the size of a goose egg, pushed down low, and to the left side, under the mass. He opened the gestation sac and delivered the baby and proceeded to deliver the placenta, when he was compelled to desist, as the hemorrhage was so profuse. He packed the sac with iodoform gauze, and closed the abdomen. He made no attempt to remove the tube with its contained sac, as the bowels were very adherent to it. Mother and baby did well, and since birth, the child has thrived beautifully and is in every respect a nicely developed baby; but for a few weeks there was a slight contraction of the head, toward the right side. This got less as the child grew older and is now absent altogether.

It will be noted in these two patients, there were none of the signs of a violent rupture of the tube at the sixth, eighth or tenth week, the women had not lost blood in the early weeks to make them doubt that they were pregnant and their condition was much as it is with other women in the early months of intrauterine gestation. They continued to be about until the adhesions which had taken place between the bowels and the fetal envelope had caused the sudden and alarming symptoms of partial and even complete obstruction. Obstruction of the bowels is a very rare and even unknown occurrence in a pregnant woman, if she has never had a previous intraperitoneal operation, because the pregnant uterine body is smooth and freely movable and is lifted up and adjusts itself to the distending influences of bladder and bowels in its progressive development.

In neither of these cases were we (the attendants) impressed by the loud heart sounds and their more superficial character, nor by the fact that the baby lay mostly to one side and that the extremities were more palpable and other signs and symptoms as given in the classical descriptions of this condition; but we were impressed, that on vaginal examination, we felt a cervix harder in consistence and outline than one would look for in a uterus at term, and we were struck with the resistance to the examining finger of a hard body which felt like a small fibroid tumor low down in the pelvic outlet. As a result, the diagnosis was made of fibroid tumor, in both cases, complicated with pregnancy, and operation was advised when the physical condition of the patient justified the undertaking.

It is needless for me to say that we all recognize the necessity of making an absolute diagnosis without confrontation, but it is also

desirable, for the surgeon's protection from unkind criticism of the laity, that we, at all events, express our suspicions as to the possibility of there being present other pathologic conditions simulating the one under consideration. A very serious situation immediately presents itself: if the woman be pregnant intrauterine, even in the presence of an obstructing fibroid, her baby must be left undisturbed until labor sets in or until there is the strongest assurance possible that the baby is strong and viable; but if the fetation is extrauterine then there is room for serious discussion and surgeons differ as to the best methods of procedure. After looking at the question from every angle and studying recent statistics and the successes of modern operators, it seems to me, the position we must take, as a general proposition is, in every extrauterine pregnancy the embryo should be removed as soon as the diagnosis can be made, whether there be life or not in the aberrant product in the greater interests of the more important body, the mother. This position should be taken in most cases up to the seventh month, after which, if the mother is in good condition, in fact, is not conscious that she is carrying an extrauterine baby, as she has had so few unnatural or distressing symptoms and can be carefully watched and frequently brought under observation, the product may be left until it is stronger and with a greater prospect of living, perhaps until labor is about to set in, but never in the hope that spurious labor is to set in to kill the baby, so that it can be removed some time later when the placenta may be loose and more easily delivered.

To leave a baby in the belly to die with the expectation that favorable degeneration will take place is, to my mind, unscientific and most undesirable in the interests of the woman and her progeny and in any other locality and for any other condition would be altogether at variance with modern surgical principles. Admitting therefore, that under favorable conditions, we are sometimes justified in withholding surgery after seven months, in the interests of the child, we must ever be mindful that we can give no real assurance that the baby will remain innocuous in its acquired envelopes and the mother will be free from danger for some weeks or months, or that an operation will be less hazardous when spurious labor sets in, or that hemorrhage, if an attempt be made to remove the sac and placenta at the time of the operation, will be less severe. Then, too, we know that extrauterine babies, who have been removed by operation, are not likely to live longer than a few days and if they do and have survived the first weeks of worldly existence, have we ample proofs that they will be strong and healthy mentally and physically in adult life; or are they not so seriously deformed, in a large

majority of the cases, that they become an unfair worry to their families and an increasing care to themselves as they grow older?

Therefore, increased risks and unhappy disappointments should not be invited simply in the hope of getting a living baby, as our social order with its strenuous competitions demands babies to start in life without hazards and on an equal footing with their fellows. I realize that religious and false sentimental grounds may offer a specious argument for the salvation of all living souls. Nevertheless, we do know that some of these babies have grown up to be strong and useful men and women and therefore, the longer they can be left, all things being equal, the more vigorous will the child be and the better for survival will they be after birth. Then, too, it is maintained and perhaps on good grounds, that an extrauterine pregnancy that has passed the sixth or seventh month is so well surrounded by a thick connective tissue covering that the dangers of secondary rupture and even other complications are not great, but I am not prepared to accept these claims nor are they borne out by facts, nor were they borne out in our two cases.

When death has taken place before the surgeon's arrival, I believe the first indication is to remove the dead baby as soon as possible, because, until the surgeon opens the abdomen, he cannot tell what disposition can be made of the placenta, whether the whole mass, sac and placenta can be delivered without great danger or whether it would be best to leave both sac and placenta because of the dense and general attachment to adjacent structures, or to simply remove the fetal product and pack the sac with iodoform gauze 5 per cent, or to sew the sac to the edges of the incision or the abdominal wall and then wait until Nature dictates what course shall be pursued later. Perhaps no infection will result and the placenta in time may be absorbed or degenerate into a lime inundated mass, which may be removed later or it may separate and finally get loose in the bottom of the wound and can be lifted out without danger, or suppuration may set in and serious sepsis may follow, conditions which must be met by recognized surgical treatment.

If the mass can be clamped off on each side at the infundibulopelvic ligament and at the uterine end of the tube and the broad ligament, it might be safe to remove the placenta as it was in Werder's case reported by him in the Transactions of this Association in 1908, with very little oozing or loss of blood and yet, in his other two cases the bowels and adjacent structures were so agglutinated to the mass that clamping was impossible and he did what many other operators have also done, tried to remove the placenta. He encountered such a terrific hemorrhage that the patient died soon after leaving the operating table, and such would have been the result if Potter had not packed the

cavity with iodoform gauze and closed the incision, because when he tried to separate the afterbirth, the bleeding was very great and alarming.

The placenta, no doubt, in Potter's case shriveled up and portions of it became absorbed or what remained had taken on calcareous degeneration as is sometimes the case in an old retained piece left in the uterus and under favorable conditions, later, it can be removed by abdominal section if it causes any further trouble. Of course, such a good result does not always follow, because Dunning's case, as reported in the 1899 Transactions, began to suppurate, sepsis set in and on the eighth day, because of impending death, he pulled on the cord, which he had left hanging out of the incision, and the woman died in a few minutes from a severe hemorrhage.

Another interesting case, Dr. Bonifield reported at our 1906 meeting in Cincinnati and which does not appear in our Transactions. He showed a well nourished boy about two years of age, who was in perfect physical condition, with a band-like mark around his forehead. The mother was brought into the hospital in the middle of the night with a diagnosis of extrauterine pregnancy at term. She was in labor and was given a hypodermic of morphine and the next day the doctor operated. He found the pregnancy in the right tube. The mass could be well lifted up and the doctor did a supravaginal hysterectomy, commencing from the left side and tying off the ovarian artery, round ligament and uterine artery on that side and after cutting through the neck of the uterus, he clamped off, high up, the right uterine and ovarian arteries and was able to shell out the whole gestation sac with little or no bleeding. The child's head seemed to be protruding through the fimbriated end of the tube and where this end of the tube surrounded the head, there was a compression in the skull and the head was flexed backward until the occiput rested between the shoulders. This flexion, however, was entirely overcome before the mother left the hospital. The boy has grown up to be a fine young fellow.

Kirchner, in the 1909 Transactions, reports a case of ovarian pregnancy in which he was able to clamp and tie off the whole mass. The mother and baby did well. The child was a full term male baby, mulatto, fully developed, with no deformities, but somewhat poorly nourished. He was brought up by artificial feeding and thrived and at the end of ten months mother and baby were in good health. This is the only case reported in our Transactions (1888 to 1921), where a living baby, located extrauterine was delivered alive and lived for any length of time. It was therefore, an unusual experience for me to have seen two cases in one year, which occurred in Dr.

Potter's practice and both of them were the first he had encountered in his large obstetrical service.

To me, the crux of the whole problem is, what shall be done with the placenta; and I am satisfied there can be no hard or fast rules laid down to govern the surgeon. I think the best surgeons today let it alone, *in situ,* if the sac can't be adequately clamped off and the whole mass removed; and then if it sloughs, treat it as we would any other sloughing wound in which suppuration and sepsis occurs. Of course, these are most undesirable complications but they give a better outlook for ultimate recovery than to tear away a placenta from its firm bed of attachments and have a primary fatal hemorrhage.

And now, in closing, permit me to summarize this important subject and try to confine, if possible, our discussion to the signs and symptoms of extrauterine pregnancy at or near term and its surgical treatment.

First, the diagnosis of extrauterine pregnancy at term should be made and vaginal examination reveals the most important sign, namely, a cervix although soft, has not the characteristics of a cervix at term with an intrauterine product, and above it can be felt a hard body which is the uterus, perhaps pushed to one side.

Second, a history of bowel obstruction, as in our two cases, is of great importance.

Third, extrauterine fetation always calls for surgical relief and the operation should be undertaken just as soon as a diagnosis is made, whether the embryo is viable or not. If, however, the case has passed beyond the seventh month, the surgeon may wait until the baby is stronger, providing the patient is in good condition and can be seen often and can be kept under the closest observation.

Fourth, I do not believe the woman should go into spurious labor and wait for the death of the baby to take place and then leave it to adipocere or take on the more or less favorable changes which it sometimes does, because such a course could only help in the delivery of the placenta, the sac would probably be just as adherent to the surrounding structures and if attempts were made to separate it, a fatal hemorrhage might take place.

Fifth, if the mass can be tied off at both ends, an attempt should be made to remove the sac and placenta, which perhaps will be possible if the pregnancy be tubal or tuboovarian, but if there be much oozing or bleeding, the sac should be packed with 5 per cent iodoform gauze and the placenta be left *in situ* or the sac can be sewed to the abdominal wall, where very great caution must be exercised not to disturb the placenta by pulling or tugging on it, until it is free in the sac cavity; in fact, let Nature make such disposition of it as she will and if suppuration or other complications set in, they must

be met as would such complications in other places on general surgical principles.

We have brought together a record of sixty-two authentic cases of extrauterine child, born alive, and living 30 days or longer, and mother surviving.

REVIEW OF THE LITERATURE AND CASE REPORTS

Sittner, (Brandenburg) collected a total of 179 cases where extrauterine pregnancy went to term (*Arch. f. Gynäk.*, 54:526, 1901. *Centr. f. Gynäk.*, 27:33, 1903. *Arch. f. Gynäk.*, 84:1, 1907).

Howard Kelly gives a table of 77 cases in his "Operative Gynecology," 1898, Vol. 2, pp. 458-59, but all of these are included in Sittner's study.

Joseph Delcamp in his "Grossesse Ectopique avec enfant vivant," Paris, 1918, gives 47 cases, but 12 of these are on Sittner's list.

E. A. Ayers gives a list of 149 cases (from 1880 to 1898) in "Obstetrics," Vol. 1, p. 87, Jan., 1899.

The following list of 63 authentic cases represents extrauterine pregnancies where the child was born alive and the mother survived and the baby lived one month or more.

CASE 1.—Muller, 1809. (*Bull. Sc. Med.*, Paris 1811, 8, 406.) (Cited by Sittner.) Twenty-four years old, in labor for several days. After reaching conclusion that fetus was not "in the uterus but in the left ovary between the tubes", abdomen was incised, fetal sac incised, child and placenta extracted. Mother and child survived.

CASE 2 and 3.—Gardian, 1816. (*Traité complete d'Accouchements*, Paris, i, p. 518). CASE 1.—The labor was just beginning and the child was fully developed in the tube. The delivery was made by Brewer of Leipsic by gastrotomy.

CASE 2.—This case was reported to the Paris Academy of Surgery. One child was in the intrauterine position; while this was being delivered a second child was recognized in the abdomen. The abdomen was incised and both mother and child were saved.

CASE 4.—King, John, 1817. (*New York Medical Repository*, n. s. 111, 288). The patient had been four days in labor and delivery was effected by a large incision of 5 to 6 inches through the vagina, carried downward and backward. The descent of the child was aided by contraction of the abdominal muscles and with the aid of forceps and external pressure by assistants, delivery was completed. The child had to be revived by artificial respiration. The intestines were herniated through the wound on the third day, but the mother was able to be about on her feet in two weeks.

CASE 5.—Schreyer, Hamburg, 1837. (*Sept. Monatschr. f. Geburtskr'k. u. Frauenkr.;* 14.) (Cited by Sittner.) The patient was aged forty-two years, iii-para. The last previous confinement was thirteen years before this time. There was slight menstrual flow in the first three months. In the last six months there was great discomfort. The fetal parts were distinctly palpable. Extraction of the fetus was done through a median line incision. The placenta was expelled through the wound by the force of the labor pains. Both mother and child recovered.

Case 6.—Jessop, T. R., 1876. (*Obst. Trans.;* London, 1877, xviii, 262.) The patient was twenty-six years of age and had had one child delivered normally. The patient's symptons were abdominal pain with vomiting, constipation, fever and a hard swelling in the lower side of her body. Delivery was effected through a 6″ incision in the median line of an extrauterine gestation. The back of the child was covered with omentum. The funis passed transversly across the wound and around the left thigh of the fetus to its umbilical attachment. The child was lodged in the midst of the bowels and free in the abdominal cavity. The placenta covered the inlet of the pelvis, ''like the lid of a box'', being attached to part of the large bowel and posterior abdominal wall. It was left in situ and for a month there was a profuse offensive discharge from the wound. Healing occurred on the seventy-second day after the operation. The child lived for 11 months and died from croup and inflammation of the lungs.

Case 7.—Matthieson, 1884. (*Brit. Med. Jour.,* May 24, 1884, i, 999.) The patient was thirty-five years of age and had five living children. The symptoms during the pregnant period were those of extrauterine gestation. Delivery was undertaken by vaginal incision without anesthesia. It was a face presentation and forceps were used to aid delivery. The child was easily revived. The placental attachment was on the posterior left side of the cavity 2″ from the vagina. It was easily detached and bleeding was controlled by sponging with perchloride of iron. Blood clots were removed from the cavity. The patient was much exhausted. The child weighed 8 pounds 7½ ounces and the placenta was three-lobed. The wound healed in three months. Both mother and child recovered.

Case 8.—Treub, H., 1887. (*Zeitschr. f. Geburtsh. u. Gynäk.;* May, xv, 2.) The patient was thirty-four years of age, ii-para. She had frequent attacks of pain during her pregnancy and expelled decidua in the fourteenth week. In her sixth month, she had peritoneal symptoms. Operation was performed two to three weeks before the end of pregnancy by an abdominal incision. The placenta was pierced by the hand and the child was extracted, and the portion of the sac containing the placenta was split from the parietal peritoneum by blunt dissection. Part of the sac which was firmly adherent to the intestine was not removed. Both mother and child recovered.

Case 9.—Olshausen, R., 1888. (*Deutsch. med. Wchnschr.,* Nov. 1890, No. 9.) (Cited by Sittner.) Thirty-year-old para ii. Previous confinement seven years before. Symptoms of abdominal pain, fever, expulsion of some membrane continued to the end of pregnancy. Operation was performed 18 days before term by a median incision. The child was free between the intestines and was without any sac. There was no amniotic fluid but coagulated blood was found between the viscera. The placenta was partly free in the abdominal cavity and partly attached to the right lateral ligament. The child weighed 5 pounds. Both mother and child recovered.

Case 10.—Taylor, J. W., 1891. (*Trans. Obst. Soc.,* London, xxxiii, 115.) Patient aged thirty-five, para v. The youngest child was eleven years of age. Symptoms of irregular hemorrhage and abdominal pain. Tubal pregnancy was diagnosed. Delivery was effected by left lateral incision directly over the child's head. The child was without a sac and free in the abdominal cavity except for a cover of the omentum. The placental attachment was in the pelvis to the right of the median line. The cord was drawn through the incision and the wound sutured around the cord and a glass drainage tube. The wound was re-opened 12 days later and the putrid placental mass was thoroughly removed. An alarming hemorrhage followed. Also thrombosis and septic temperature. Recovery occurred in three

months. The child weighed over 7 pounds. Its head was deformed and neck depressed on the right side. There was deformity of the right foot and right leg. Death of the child occurred through convulsions at the age of five months.

CASE 11.—Rein, G., 1892. (*Centralbl. f. Gynäk*, No. 50.) (Cited by Sittner.) Thirty-five-year-old para v. Symptoms began in the second month, with hemorrhage, collapse and illness and lasted 1½ months. Operation was done in the thirty-eighth week by abdominal incision. The placenta was anteriorly situated. Hemorrhage was controlled by compression and ligature of the vessels. Fetus was extracted without its membrane, after the manner of an intra-ligamentary cyst. Glass drainage was put in the wound. The decidua was expelled two days after operation. The child weighed 3,200 grams. Mother recovered. Child still living.

CASE 12.—Frommel, R., 1892. (*Münchener med. Wchnschr.*, June, 1891, No. 1.) (Cited by Sittner.) Thirty-one-year-old para iii. Symptoms: from the fifth month there was much discomfort, confining the patient almost constantly to bed. Operation was performed in the forty-ninth week, after cessation of menstruation. Incision was made through the median line and the child was found in a subserous, intraligamentary position involving the mesentery of the large intestine. The mesentery of the colon was resected and the vessels ligated. An attempt was made to enucleate the sac and the placenta but this was unsuccessful. Hemorrhage had to be controlled by tampons. The mother became pulseless but recovered. On the fifth day there were symptoms of iodoform poisoning. The placenta was removed seven days after the operation and its removal was followed by a violent hemorrhage. Later a fecal fistula developed. The mother recovered. The child weighed 1880 grams, showed a contracture of the right sternocleido muscle, and also a depression on the left side of the skull. Its death occurred at four and one-half months from gastric catarrh.

CASE 13.—Urbain, La Bouverie, 1893. (*Bull. de la Soc., belge de Gyn. et d' Obst.* 1893.) (Cited by Sittner.) Para ii, age thirty-three years. The last confinement was thirteen years previous. In the fourth month there were violent peritoneal symptoms. Operation was delayed notwithstanding an early diagnosis until the fortieth week. A thin-walled fetal sac was found behind the uterus. The sac was ruptured and considerable hemorrhage occurred. Extraction of the fetus and removal of the placenta was accomplished. Violent hemorrhage was checked by clamping and tamponing. Only a part of the sac was removed and the abdominal wound was partly closed. Recovery occurred.

CASE 14.—Rein, 1894. (*Monatschrift f. Geburtsh. u. Gynäk*, Aug., 1897.) (Cited by Sittner.) The patient was a thirty-three-year-old primipara. The operation was done in the thirty-fourth week. Fetus was extracted and the placenta removed. The sac was ruptured and tamponed. The mother recovered and the child lived for two years.

CASE 15.—Pestalozza, E., 1895. (*Annali di Ost. e. Gin.*, July, 1895.) The patient was a thirty-three-year-old para iii, her last confinement being one and one-half years previous. During the second month the patient had hemorrhage for fourteen days with pain and loss of consciousness. These symptoms recurred frequently. Labor-like pains necessitated an operation in the thirty-eighth week. The fetus was uncovered and found free in the abdominal cavity. Extraction was accomplished and the fetal sac containing the placenta was removed from an intra-ligamentary position. Ligation of vessels and of the ligament was done. When the sac and placenta were removed the hemorrhage was so violent that total extirpation

of the uterus was done. The mother recovered. The child was slightly deformed but lived.

Case 16.—Herff, O., 1895. (*Zeitsch. f. Geburtsh. u. Gynäk.*, xxxiv, 1.) (Cited by Sittner.) Twenty-nine-year-old para iii. Last confinement eight years previous. Symptoms violent hemorrhage in the early part of the pregnancy and later peritoneal symptoms accompanied with discomfort, vomiting, difficulty in breathing. Operation in the thirty-third week. The fetal sac was torn on the median side and the fetus was without covering and free between the intestines. After removal of the fetus adhesions were separated, blood vessels ligated and the sac and placenta were removed. Considerable hemorrhage followed but this was checked by gauze compresses. Convalescence was accompanied by fever and venous thrombosis. The mother recovered. The child was deformed and died three and one-half months after birth.

Case 17.—Tauffer, E., 1895. (*Centralbl. f. Gynäk.*, 1896, No. 1.) (Cited by Sittner.) The patient was a thirty-year-old iv-para, whose last confinement was 2 years previous. In the third month violent pains with fever and loss of consciousness, also bladder disturbances occurred. Operation was done at the end of pregnancy. Through an abdominal incision a fully developed sac was found behind the uterus at the right from the lat. ligament. The fetus was removed and violent hemorrhage followed after partial separation of the placenta. Ligation of the right lat. ligament, spermatic and uterine arteries, was done and drainage established through the vagina. Convalescence was complicated by thrombosis in the left leg. The mother recovered but the child, which was deformed, died after four months.

Case 18.—Ludwig, H., 1896. (*Wiener klin. Wchnschr.*, No. 27.) (Cited by Sittner.) Para vi, thirty-five years of age. Symptoms began in the third month. At term one child was delivered spontaneously and another child was observed in the abdomen. On the fifth day the patient travelled for seventeen hours to Vienna for operation. Through a median incision there was found a thin sac of fetal membrane and ovarian tissue, and on the under side the placenta was adherent to the uterus. The sac was incised and the fluid escaped. The fetus, uterus, sac and placenta were successfully removed. The mother and both babies lived.

Case 19.—Sacchi, P., 1896. (*Gazetta med. Cremon.*, June, 1897.) (Cited by Sittner.) Thirty-one-year-old iii-para. Last confinement ten years previous. In the early months the patient had great discomfort and continued hemorrhage. Operation was done in the thirty-third week and the fetus was uncovered between the intestines and removed but the placenta was left behind. It was inserted into the pouch of Douglas and the right lat. ligament. The decidua was expelled on the third and fourth day after operation. The mother and child both lived.

Case 20.—Rokitansky, C., 1897. (*Centralbl. f. Gynäk.*, 1898, No. 13.) (Cited by Sittner.) Thirty-six-year-old para-iii. Last confinement was one year previous. Symptoms violent pains, absence of menstruation for five months. Operation in the thirty-sixth week. The fetal sac was adherent to the intestines. The sac was ruptured but it contained very little amniotic fluid. Both the fetus and placenta were removed and violent hemorrhage followed which was controlled by tamponade. The sac was partially ligated. The mother recovered and the child lived but was badly deformed and was partially paralyzed.

Case 21.—Charles, N., 1897. (*Jour. d' accouchements, Liege*, 1897; 18, p. 453.) Extrauterine pregnancy in a previously healthy primipara. Laparotomy at term.

Mother and child both lived. The mother had a subsequent pregnancy which was intrauterine with normal termination.

Case 22.—Benchiser, A., 1899. (Cited by Sittner; private communication, 1906.) Tripara twenty-nine years of age. The last confinement fourteen months previous. Symptoms hemorrhage during the first three months, at the menstrual period. The patient passed through a state of collapse in the third month. In the last stages of the pregnancy there was involuntary defecation and strangury. Operation was done in the last week of pregnancy. The sac was incised and the fetus removed. The placenta was found adherent to the transverse and the descending colon. The placenta and greater portion of the fetal membranes were removed. The right lig. lata was ligated and the uterus extirpated. The mother and child both lived.

Case 23.—Cragin, A. B., 1900. (*Am. Jour. Obst.*, 41; 740.) Patient was twenty-four years of age. Symptoms of pain and bleeding during three months. At operation an intra-ligamentous gestation was found with the right tube passing over the middle of the upper surface of the sac. Living child was removed and the placenta left in situ. The placenta completely came away in twenty-four days. The child and mother both lived.

Case 24.—Sneguireff, 1900. (Cited by Sittner from a private letter.) Thirty-year-old para-iii. The pregnancy was without discomfort. Operation was performed about the thirty-second week. The fetal sac was intraligamentary and the placenta was extracted rapidly, and the spermatic vessel was ligated. The larger part of the sac was extirpated. The mother recovered and the child is still living.

Case 25.—Cragin, A. B., 1900. (*Am. Jour. Obst.*, 1901, xliii, 96.) Patient aged thirty-three years, had had two miscarriages. Symptoms abdominal pain, alternating constipation and diarrhea. The gestation was found within the folds of the left broad ligament and the sac was ruptured. A living child was delivered. The mother and child both lived.

Case 26.—Winter, A., 1902. (Cited by Sittner, private letter.) Twenty-six-year-old para ii. Operation in the twenty-first week. The sac filled the entire pouch of Douglas. The sac was adherent to the uterus and right lateral ligament. The left uterine cornu and the spermatica were ligated. The sac was removed from the pouch of Douglas with a living fetus. The mother recovered.

Case 27.—Winter, A., 1902. (Cited by Sittner.) Thirty-four-year-old primipara. Symptoms of sudden abdominal pain in the fourth month with moderate bleeding. Operation about the twenty-fifth week. The sac was enucleated and a living fetus was extracted. The placenta was removed from the anterior wall of the sac. The tubal sac was unruptured. The mother recovered.

Case 28.—Perles, 1901. (Cited by Sittner, private communication.) Thirty-eight-year-old primipara. Symptoms in the third and fourth month of pain and moderate bleeding but no collapse. Operation was performed in the 40th week. The tubal sac was found unruptured and was mostly in an intraligamentary position and firmly adherent. The fetus was removed and placenta, and as much of the sac as possible. The mother recovered. The child had a depression of the left side of the skull, deformity of the right elbow and of the lower limbs. The child was living at 14 months.

Case 29.—Perles, 1902. (Cited by Sittner, private communication.) Thirty-two-year-old para-iii. Last confinement ten years previous. There were symptoms of collapse and bleeding in the third month. Her labor began in the fortieth week.

At operation a fetal sac was found in a partly intraligamentary position and firmly adherent. Part of the amniotic fluid had escaped into the peritoneal cavity. The fetus was removed and as much of the sac as possible. The mother and child are both living.

Case 30.—Fischer, A., 1902. (Cited by Sittner, private communication.) Twenty-six-year-old para-ii. Last confinement seven years previous. Symptoms of violent abdominal and lumbar pains in the early part of the pregnancy. Operation about the thirty-eighth or fortieth week. The fetus was found within an intact tubal sac which was adhering to the uterus and intestine. The placenta and child were delivered and no ligaturing of vessels was required. The sac was sutured in place. The mother recovered and the child lived for two years.

Case 31.—Calderini, G., 1903. (*Atti d. Soc. ital. di Ost. e. Gin.* Oct., 1903, iv.) (Cited by Sittner.) Forty-year-old para-v. Last confinement eight years previous. Symptoms gave but very slight discomfort. Operation was done in the forty-second week. The uterus was found adherent to the peritoneum in the abdominal cavity The fetus was removed and the placenta and sac could not be removed on account of their insertion deep in the right pelvis. A decidua was expelled on the seventh day after the operation. Patient was discharged eight weeks after the operation but had a discharging fistula. The placenta came away through the fistulous tract four and one half months after the operation. The mother recovered and the child is still living.

Case 32.—Perlis, W. (*Centralbl. f. Gynäk.*, 1903.) (Cited by Delcamp.) Primipara, age thirty-eight. Symptoms of pain and bleeding during the first months of pregnancy. Operation was done ten months after the cessation of menstruation. The placenta was extirpated. The mother recovered and the child lived but was greatly deformed having a flattened skull and no motility of the shoulder joints. It also had club feet. It was living fourteen months after birth.

Case 33.—Schmidt, 1903. (*Wien. klin. Wchnschr.*, 1904, No. 19.) (Cited by Sittner.) Para iii, age thirty-two, violent abdominal pains at third and seventh months. Labor-like pains for four weeks. Uterus displaced to right by tumor reaching to ensiform. Operation thirty-seventh week, peritoneal cavity full of liquor amnii and vernix. Live male child extracted, 2550 gm., survived. Fetal sac formed by left tube adhering in pouch of Douglas. Extirpated, including placenta. Violent hemorrhage, tamponade. Recovery uncomplicated, decidua expelled nine days after operation.

Case 34.—Popoff, D., 1904. (*Russk. Wratsch.*, 1905, No. 27-29.) (Cited by Sittner.) Twenty-year-old para iii. The last pregnancy was four years previous. At the end of the second month there were six weekly hemorrhages. In the fourth month violent pain and loss of consciousness. In the remaining months the patient was ill and uncomfortable. Operation about the fortieth week. The fetal sac was found reaching to the ensiform process and communicated with the intestines and omentum. The uterus was enlarged, elevated and was adhering posteriorly to the anterior surface of the sac. The left tube passed over the sac while the right tube and ovary were adherent to the sac. The intestine was also adherent to the sac. The adhesions were partly freed, the left tube ligatured, sac incised and the fetus removed. Violent hemorrhage occurred and was checked by a clamping and by ligature of the spermatica. The sac and placenta were removed in toto. The patient recovered rapidly after a slight lung infection. The child was deformed and died after five years from intestinal catarrh. In this case the fetal sac contained the placenta. The wall of the sac contained follicles and corpora albicantes. This was a left ovarian pregnancy.

Case 35.—Michin, P. W., 1905. (*Russk. Wratsch,* 1905, No. 12.) (Cited by Sittner.) The patient was thirty-eight years of age, para iv. Her last pregnancy was thirteen years previous. The early symptoms were abdominal pains. The later symptoms compelled operation at about the thirty-ninth week. The fetal sac was found adherent to the abdominal viscera. The fetus was removed and also the placenta, without hemorrhage. Part of the sac membrane was removed and the remaining part sutured and tamponed. Both tubes and both ovaries were normal and not involved in the sac formation. The mother recovered and the child died one month after birth. This was considered a case of primary abdominal pregnancy.

Case 36.—V. Ott, 1905. (Reported by Landau and Jacobson in a private communication.) (Cited by Sittner.) Thirty-six-year-old para ii. Last confinement eleven years previous. The symptoms were hemorrhage, violent attacks of pain and fever. Operation was done in about the thirty-seventh week. The fetus was found in the fetal membranes in the pelvic cavity. The lower portion of the sac was formed from the enlarged ruptured tube and adherent intestines. The sac was incised, the fetus extracted and the placenta, which was inserted in the posterior wall of the uterus and in the intestines, was separated. The wound was tamponaded. The convalescence was febrile and complicated by exudates. The mother recovered and the child lived.

Case 37.—Jerie, J., 1905. (*Casop. lek. cesk.,* 1906, p. 913.) (Cited by Sittner.) Para v of thirty-seven years. Her last pregnancy was seven years previous. Her symptoms were those of sudden pain, loss of consciousness and vomiting. Three weeks before her operation there were labor pains which were repeated in thirteen days. The operation was done in the forty-third week and the child was found to the right and beside the enlarged and elevated uterus. The sac had formed of the ruptured tube and of pseudomembranes which were adherent to the left adnexa and the right margin of the uterus. The upper part was adherent to the posterior surface of the pouch of Douglas and the intestines. The sac was incised and there followed a slight flow of amniotic fluid, and also a violent hemorrhage, from the sac and ruptured placenta, the latter being inserted into the ampullary portion of the right tube, ovary, Lig. latum, rectum and mesentery of the small intestine. The hemorrhage was checked by ligature. The sac and placenta, excepting a small portion, were removed, along with the left tube. The puerperium was complicated with pneumonia and suppuration of a hematoma. The remainder of the sac expelled through the wound. The child was deformed in the face, feet and hip joint. It is still living.

Case 38.—Popoff, 1905. (*Wratsch,* 1905.) (Cited by Delcamp, p. 54.) The patient was twenty years of age and had had two miscarriages. Her symptoms were abdominal pain, nausea and vomiting. The operation was performed in the eighth month. The fetal cyst was found to be very adherent and vascular and the placenta had a pelvic insertion. The cyst, placenta and adnexa on the one side were all extirpated and a living child delivered. This was proved histologically to have been an ovarian pregnancy. The mother recovered and the child lived.

Case 39.—Landau, T., 1906. (*Berl. klin. Wchnschr.,* 1906, No. 32.) (Cited by Sittner.) The patient was thirty-nine years old and a para v. Her last confinement was eight years previous. She had had an ovariotomy six years previous with an illness of several months from gauze left in the abdomen. The pregnancy symptoms began in the second month, with violent attacks of pain, loss of consciousness and vomiting, followed by ileac symptoms. Later there was decrease in weight, loss of strength and continued discomfort. Labor pains were artificially induced without result. An operation was done in the thirtieth week. There was

much difficulty in severing adhesions. In attempting to remove the sac it fell out and the amniotic liquid escaped. The fetus was extracted, the sac removed and the vascular part of the upper portion of the sac was ligated. The right ureter passed over the left side of the sac and had to be pushed aside. The base of the Lig. latum was ligated and the sac and its contents were removed. The wound area was tamponaded and an abdominal hernia was incised. The mother recovered and the child lived but had left torticollis. The mass removed with the child consisted of the sac, covered with adhesions, the wall being fibrous tissues with bundles of smooth muscle and placenta and fetal membranes. A portion of the tube was observed on the outside of the sac. A part of the tube was dilated to about the size of a fist and showed microscopically long hairs and foreign body cells in the meshes of a fibrous reticulum.

Case 40.—Landau, T., 1905. (*Deutsch. med. Wchnschr.*, 1906, No. 30.) The patient was a para ii of thirty-four years. Her last pregnancy was fourteen years previous. The symptoms of her pregnancy were discomfort, violent attacks of pain and peritoneal symptoms. There was retroflexion of the uterus and the complication of a left hematocele. Fetal movements were felt in the fifth month. In the thirty-second week there was a violent attack of peritonitis. In the fortieth week violent pain occurred with marked swelling of the abdominal tumor. The cervix was opened and the uterus was found to be empty. Further operation revealed the sac, which fell out and a large quantity of the amniotic fluid was expelled. A violent hemorrhage was controlled by compression of the aorta. The fetus was removed and the placenta was found in the posterior wall of the sac, being ⅓ in the true pelvis and ⅔ in the abdominal cavity. It was dissected free and removed. The sac was formed of fetal membrane and numerous adhesions to the abdominal and pelvic viscera. It was removed with gradual torsion of the Lig. latum. The mother recovered after thrombosis of the left leg. The child was reported as still living.

Case 41.—Jacomet. (*Echo med. du Nord.*, June 23, 1907.) Primipara, age twenty-six, who had had a previously unoperated salpingitis. During the first five months there was pain and nausea. In the eighth month the patient had pains simulating those of labor. Laparotomy revealed a placenta inserted on the uterine wall. The child was removed. The mother recovered. The child lived but had atrophy of the toes.

Case 42.—Lockelt, G. V., 1908. (*West Canada Med. Jour.*, Oct., 1908, ii, 475.) The patient was thirty-four years of age and had had four previous normal pregnancies and one abortion. Her symptoms were those of morning sickness, pain and hemorrhage. In her sixth month an elevation of temperature occurred with pain and tenderness and swelling in the region of the appendix. During the last three months she suffered continual pain and at the end of this time labor pains came on. At operation chronic peritonitis, with free fluid, adhesions of the omentum and small intestines to the fetal sac, were found. The sac was incised and a living child extracted. A severe hemorrhage followed and the patient's condition became critical for two weeks. Notwithstanding the sudden death of her father and the results of an earthquake, which buried her in the ruins of her house, she recovered and the child lived and was normal except for a slight asymmetry about the head.

Case 43.—Potocki. (*Bull. med.*, Paris, 1908, xxii, 55.) Primipara, age twenty-three. Her pregnancy was marked by recurring seizures of pain and expulsion of blood and membranous debris. Operation was followed by profuse hemorrhage. The fetus, placenta and tube were removed. The fetal membranes were adherent

only to the intestines. The patient had an uneventful recovery. The child lived but was microcephalic. It developed normally for six months, then had convulsions, strabismus and paralysis of the lower limbs. The convulsions continued for two years leaving the child deaf and idiotic. The child died at four years from convulsions.

CASE 44.—Blesh and Reed, 1908. (*Jour. Am. Med. Assn.*, June 27, 1908, 1, 2137.) Mulatto, age twenty-four. One normal delivery three years before. Early symptoms were those of paroxysmal pain. At operation the child's head was found presenting in the pelvis behind the uterus. The sac containing the child was easily separated from the peritoneum. The child was delivered but was not easily resuscitated. No attempt was made to detach the placenta which was firmly attached to the mesentery of the small intestines. Eight weeks later it was removed without hemorrhage. The mother and child are both well.

CASE 45.—Tissier, 1908. (*Bull. med.*, 1908, xxii, 600.) Patient aged forty-four years. Diagnosis of fibroma was made, and later cesarean section at term was performed. The uterus was found greatly hypertrophied. It was incised but found empty. The intra-ligamentary cyst was found at the right and behind the uterus, with multiple adhesions to the intestines and to the pelvis. A subtotal hysterectomy was necessary to complete delivery but a living child was finally extracted from the cyst. A normal recovery followed. The child's skull was considerably flattened and had not changed three weeks after birth.

CASE 46.—Kirchner, W. (*Am. Jour. Obst.*, 1909, lx, 855.) A colored patient, age thirty, who had had eight previous pregnancies. The early symptoms were those of pain and hemorrhage. Later there was prolapse of the uterus requiring replacement by a physician. A second prolapse occurred but replacement was accomplished by the patient herself. Near term labor pains came on and lasted for two days. Then again twelve days later after a pronounced edema of the cervix, associated with prolapse of the uterus again, the patient entered a hospital and was operated upon. A large cystic and tumor-like mass was found in the lower ⅔ of the abdominal cavity, to which were adhering numerous omental and intestinal structures. The mass was partly delivered through the incision and opened. A profuse hemorrhage occurred but the fetus was successfully delivered and easily resuscitated. The sac was attached in the right side near the ovary and was adherent to the appendix. The appendix and left tube were removed. The child was normal. The mother developed a local peritonitis and endometritis, but recovered after a protracted convalescence.

CASE 47.—Bonifield, C. S., 1910. (*Cincinnati Lancet Clinic*, July 16, 1910.) Age thirty, sterile for ten years, began to have severe pains at 6 months. Mass filled pelvis. At term abdomen opened after labor pains began. Fruit sac and uterus removed after ligating ovarian and uterine arteries. Living, poorly nourished child extracted. Abdomen closed without drainage. Sac included unruptured tube with top of head at frimbriated extremity, causing depression in the skull.

CASE 48.—Savage, T. C., 1910. (*Proc. Roy. Soc. Med.*, lii, 1911-12, Sect. *Obst. and Gyn.*, p. 72.) Primipara, aged twenty-seven. At operation the lower part of the uterus was slightly enlarged and behind the cervix pushing into the posterior fornix was the fetal mass, covered by omentum and in part by the uterus. The placenta was in front partly covered by omentum. The child and part of the placenta were delivered and recovery was fairly rapid. The baby had a slight torticollis, a moderate talipes equinovarus. Nine months later both mother and child were in good condition.

Case 49.—Bocquel, 1912. (*Arch. mens. obst. et gyn. d'Angers,* Nov., 1912, xi, 272.) The patient was thirty-two years of age. Her symptoms were diagnosed as crises of pain due to appendicitis and renal colic. At operation the placenta was found adherent to the left tube, uterus and culdesac of Douglas, also in a secondary way to the omentum. The sac was removed entire and extensive ligation was necessary to control bleeding. The mother recovered and the child lived.

Case 50.—Horsley, T. S., 1912. (*Surg., Gynec. and Obst.,* 1912, xxv, 170.) The patient was colored and twenty-seven years of age. She had had one miscarriage at four months and one full term fetus which was born dead. There was slight bleeding in the early part of her pregnancy. At operation the fetus was found floating among the intestines and was covered by a thin membrane which also surrounded the placenta. The child was delivered safely and the mother recovered in forty days.

Case 51.—Cragin, E. B., 1914. (*Am. Jour. Obst.,* 1914, lxx, 1019.) The patient was a colored woman who thought she was normally pregnant. After the uterus was found empty operation was decided upon. The fetal sac was found attached to the left tube and posterior surface of the uterus. It was surrounded by adherent omentum and coils of intestines. The sac, placenta, left tube and baby were removed. The recovery was stormy and the baby was deformed by a flattened head and deviated feet. The child's progress was steady.

Case 52.—Essen, K. H.; 1914. (*Therap. d. Gegenw.,* 1914, lv, 360.) The patient was a primipara, aged thirty, whose early symptoms were abdominal pain and hemorrhage. After a period of false labor, operation was performed and the fetal sac containing the child was found among the intestines. The child was not deformed and appeared fully developed but it was not easily resuscitated. The mother and child were normal twenty-seven days after operation.

Case 53.—Demelin and Devraigne, 1917. (From Delcamp: *Grossesse Ectopique,* p. 48.) The patient was a para ii, whose early symptoms were pain and hemorrhage. At six months the cervix was enlarged and it was decided to amputate; but on account of the expulsion of a piece of tissue and the recognition of a living child a cesarean section was decided upon when the period was completed. Later labor pains came on and operation was performed. The sac wall was found to be very thin and it soon ruptured. The membranes adhered to the abdominal wall in front with the intestine intervening. The child was removed and an attempt was made to loosen the placenta but on account of hemorrhage the tube and placenta had to be removed together with the membranous adhesions. The mother recovered and the child, though compressed on one side of the face has since progressed well.

Case 54.—Demelin and Devraigne; 1919. (From Delcamp; *Grossesse Ectopique,* p. 48.) The patient's last menstrual flow was 286 days previous. The early symptoms were abdominal pain. On admission to the hospital at the conclusion of her term, pain was so severe as to demand immediate operation. The pulse was 134 and the temperature 36.8° C., the respirations were 32 and the skin was pale and clammy. The child was found free in the abdominal cavity among the intestines. The peritoneal cavity contained meconium and amniotic fluid. The child's trunk was surrounded by a broad ligament. The child was removed but responded only after prolonged resuscitation. The placenta was inclosed within a fibrous sac which was easily removed. The mother recovered and the child is healthy and well.

Case 55.—Gilliatt, W.; 1919. (*Proc. Roy. Soc. Med., London,* 1919, 12, Sect. O. & G. 177.) The patient was at full term when admitted to the hospital and had been in labor for seven hours. The fetal mass was impacted in the left iliac

fossa and the uterus was displaced to the right and upwards. A living child was delivered by cesarean section.

CASE 56.—Stubbe, H.; 1920. (Med. Jour. Australia, Dec. 25, 1920, ii, 570.) The patient was a primipara, aged nineteen years, who was delivered of a full term extrauterine gestation.

CASE 57.—Newell, H.; 1920. (*Jour. Missouri Med. Assn.*, Sept., 1920, xvii, 35.) This author reports having personal knowledge of two extrauterine pregnancies at full term which have not thus far been reported. In each of these cases living fetuses were delivered. The mothers both recovered. This author describes only one of these cases, which was a gravid one without any untoward symptoms until the time of delivery when the patient complained of abdominal pain of intermittent character. The operation was performed by Dr. Henry Schwarz. Many adhesions were found. The placenta was punctured with a needle and profuse bleeding resulted. The sac was opened and a living fetus was delivered. The placenta was removed in two pieces leaving the sac behind. The patient bled profusely and became pulseless and went into deep shock. The patient, however, recovered and was able to leave the hospital in twenty-five days. The baby and mother both did well.

CASE 58.—Moore, E. C. (*Surg., Gynec., and Obst.*, July, 1921, xxxiii, 65.) This author reports four cases, one operated by Dorman in 1917. The uterus was the size of a three months' pregnancy and contained four fibroids. The pregnancy was in a sac connected with the right broad ligament. The baby lived and the mother recovered.

CASE 59.—The second case was operated on by the same surgeon, Dorman, in 1917. This pregnancy was intraligamentous, the attachment being to the left broad ligament. The mother recovered and the baby when last reported upon was in excellent health.

CASE 60.—The third case was operated upon by DuBose and reported by Lee. (Surg., Gynec., and Obst., 1917, xxiv, 317). This case was a colored woman, thirty-five years of age, who had given birth to an apparently full term child. The first child was delivered by a midwife. The second child was found to be an abdominal pregnancy and the patient was operated upon the following day after the delivery of the first child. A large right ovarian amniotic sac was found with a pedicle attached to the right broad ligament. The entire sac and placenta were removed. The extrauterine child weighed 2 oz. more than the intrauterine child. The convalescence was uneventful and the mother and both children were normal 22 months later.

CASE 61.—Author's case. The patient was twenty-nine years of age, and a primipara. At operation the omentum and small intestines were found adherent to the anterior abdominal wall, and this showed a recent inflammation. The mass had the appearance of a twisted pedicle cyst. The cord from the placenta extended to the left up under the spleen where the child was found free among the intestines and not surrounded by any sac. The intestines on the right side were more or less adherent to one another. The broad ligament and the placenta were removed en masse. The mother recovered and the child lived.

CASE 62.—Rozar, A. R., 1921. (*Jour. Am. Med. Assn.*, Jan. 22, 1921, lxxvi, 239.) The patient was a colored woman, age 35. Her early symptoms were vomiting, abdominal pain and blearing vision. At operation the uterus was found to be the size of a three months' pregnancy and was in front with the pregnancy behind.

The placenta was attached to the posterior surface of the uterus, the right broad ligament and intestine. The child could be seen distinctly through the amniotic membranes, and its movements could be observed. The child was safely delivered. The attachment of the placenta was easily separated, excepting from the intestines where it was more difficult. Hemorrhage was normal. The patient recovered and the baby lived.

CASE 63.—Zarate, E.; 1922. (*Semana medica é Buenos Aires.*)
The patient's symptoms during the first few weeks were diffuse abdominal pains. At operation the child was found deformed, with an abnormally short neck and large face, and the right leg was short. The placenta and sac were attached in one mass with a part of the right tube and ovary. Hemorrhage was slight. The mother recovered and the child was reported as doing well at six months.

493 DELAWARE AVENUE.

DISCUSSION

DR. GORDON K. DICKINSON, JERSEY CITY, NEW JERSEY.—About fifty years before McDowell did his celebrated ovariotomy, John Bard did a laparotomy on a woman and delivered a nine months' fetus. I well remember in the eighties amongst my early operations being called to a tenement house to see a woman who was waiting for the delivery of her child. She was three months over time. At the end of the normal period the milk left the bosom. There was a decided change in her appearance, her appetite was lost, the skin became shriveled. Nature will not let labor go over a specified time. I found she had gone three months after the regular time and discovered a shriveled up mass which looked like a dried up potato. We took her to the hospital, and Dr. Andrew McCosh assisted me with the operation. A large incision was made; the membranes looked like grocer's paper. We took out the baby, which was dead. We packed freely with iodoform gauze and she died on the next morning. Autopsy disclosed that we had tied off one ureter, and that was the cause of death.

I had a case not long ago which was diagnosed as cholecystitis. I cut down to operate on the gall bladder and found a three months' child hanging from the lower surface of the liver.

DR. RUFUS B. HALL, CINCINNATI, OHIO.—I would like to emphasize one point, that in all these cases a certain diagnosis should be made at once, and I do not say this in a spirit of criticism at all. If Dr. Hayd had given his patient the benefit of a doubt about the condition at his first visit, by giving her an anesthetic, he would have operated and saved the mother in this case. I adopted this plan many years ago, without any reference to what the family or the neighbors or the doctors would say, whether right or wrong, the plan in all doubtful cases to make a diagnosis, if that is impossible, by doing an exploratory operation.

DR. ABRAHAM J. RONGY, NEW YORK CITY.—When abdominal pregnancy is suspected, about the sixth or seventh month one of the best aids for diagnosis, that we have at the present, is the x-ray, which will differentiate it from a tumor or a cyst.

As far as the placenta is concerned, I think it is a great mistake to remove the placenta unless we find it shriveled up in the abdomen, as I have found it in two cases. When the placenta is adherent to any part of the intestines or the abdominal wall and the circulation is actively going on, it is better to leave the placenta and not attempt its separation.

DR. EDWARD SPEIDEL, LOUISVILLE, KENTUCKY.—The statement was made by the previous speaker that he had never found the x-ray satisfactory in pregnancy

earlier than six or eight weeks before full term. I would question the accuracy of that statement, and in this Association it ought not to go unchallenged because in the City Hospital in Louisville, we have now quite a series of successful x-ray outlines of fetuses that we can use for teaching purposes. This operator has a picture of a fetus at four months and is trying to get them even earlier.

Another thing that we do in Louisville, in all doubtful cases of pregnancy is to examine the patient under nitrous oxid anesthesia, inserting the full hand, if necessary, into the vagina.

DR. H. WELLINGTON YATES, DETROIT, MICHIGAN.—I also wish to accentuate the point made by Dr. Hall in relation to the early diagnosis being made under an anesthetic; also to repeat what the last speaker has said in relation to the x-ray in early diagnosis.

DR. WILLIAM D. PORTER, CINCINNATI, OHIO.—I wish to mention very briefly a remarkable case I saw in the service of Dr. William Gillespie in the Cincinnati Hospital. In this case the child was probably a little over eight months; the head was well down in the pelvis, the uterus being displaced laterally, so that the head could be felt distinctly and the sutures made out beyond any question. The stretching was so great the tissue seemed thin between the finger and the child's head. In this case an incision was made through the vaginal tissue, forceps were applied and the child delivered. The child weighed nearly five pounds and was not deformed. The cavity was packed, and the drainage kept up for a long time, and the child and woman recovered.

DR. HAYD (closing).—An interesting point in connection with this subject is that Dr. Potter should have had two of these cases in one year and yet in an experience of 15,000 confinements and over 500 cesarean sections, he had never seen such a case before nor had I ever met one. Dr. Hall is perfectly justifiable in his criticism, and in the summation of my paper I said the diagnosis should be made and I think I would have made it in Dr. Potter's second case. My patient was suffering from obstruction of the bowels, but how complete I could not tell. However, I knew she was very sick and it was no place for an immediate operation. I gave morphine and tap water by rectum and the next day she passed gas freely. Two days later Dr. Potter came home and I turned the case over to him urging him to operate, as I was satisfied it was a case of fibroid tumor with pregnancy, at or near term. I never thought of an extrauterine pregnancy and really it did not matter, because here was a uterus which low down felt like a fibroid tumor and no baby could have come through it had it been a tumor. I believe, we would have saved both woman and baby, although Potter could not get any fetal heart sounds when he examined the woman and it may be that the baby had died and the woman was in false labor, when I first saw her. We had had two or three large multilocular cyst operations in women about forty-five years of age where the diagnosis was difficult because of suspected pregnancy and as this woman was doing nicely, Potter felt like letting her alone for a few days, when suddenly she grew worse, the sac, no doubt, ruptured, and the contents, liquor amnii and blood went into the belly cavity. I intended on the following day, after I first saw her, to put a sound into the uterus and clear up the diagnosis. We could have done no harm and it might have cleared up the case. I felt the extremities of the baby and I heard fetal heart sounds and there was every indication that the baby could not be born with this obstructing mass below and advised cesarean section.

ONE HUNDRED AND FIFTY CASES OF VERSION BY POTTER'S TECHNIC

By Percy W. Toombs, B.A., M.D., F.A.C.S., Memphis, Tenn.

AT THE annual meeting of the American Association of Obstetricians and Gynecologists, held at Indianapolis in 1916, Irving W. Potter, of Buffalo, N. Y., made a report of five hundred cases of internal podalic version, which he had performed during the preceding year. The technic which he described differed in some important particulars from the classic methods described in text books and taught to students of obstetrics both here and abroad, but the most noteworthy feature of Dr. Potter's communication was not so much the manipulations which he advocated as the indications he accepted for the performance of the operation. To make use of his own words, "Version will be found especially useful in occipitoposterior positions, in face presentations, in prolapsus funis, in placenta previa occurring in multiparae, and in a moderately contracted pelvis with a small fetus. Used in all cases where there are indications of prolonged labor under natural conditions, it does away with unnecessary suffering and exhaustion of the mother and lessens the chance of injury to the soft tissues. Moreover it is an operation presenting great advantage to the mother, the child, and the attending obstetrician. It lessens shock by shortening labor, it conserves the patient's strength and does away with injuries to the baby's head." Dr. Potter asserted that "from an experience extending over many years of practice" he had reached the conclusion "that it is justifiable to perform a version for the purpose of eliminating the second stage of labor and relieving the woman of the pains and agonies of childbirth, *since such a procedure in my hands has been attended by no increase of fetal mortality, and has had a lessened maternal mortality and future morbidity.*"

Opposition did not shake Dr. Potter's conviction that his method had merits and advantages of a very high order. In 1917 he reported two hundred more cases of version performed according to his technic, with corroborative hospital charts and case records, showing even better results—both maternal and fetal—than in those previously presented.

There is no doubt that every one who visited Buffalo was very greatly impressed by Potter's remarkable obstetrical skill, the rapidity with which his deliveries were accomplished, and the excellent postpartum condition of his patients. That Potter's method was sat-

isfactory and excellent when Potter employed it, was established beyond the gainsaying of even his most determined adversaries. The question was now resolved into whether it were possible for others to acquire the skill necessary to perform version according to the Potter method. This, his opponents held, and still hold, to be impossible. As Rongy of New York, one of the most violent "obstructionists" of the Potter technic, has put it, "Since witnessing two versions performed by him * * * my reason for opposing his teaching became still greater, because I find Dr. Potter to be a master in obstetrics and I dare say that there is no one in any lying-in hospital in the United States that knows how to perform versions as well as Dr. Potter. I honestly believe that it is still a dangerous procedure to be applied by the average obstetrician in any of the lying-in hospitals. What Dr. Potter can do very few of us are able to do as far as version is concerned, but I do want to reiterate that this procedure must not be made light of, otherwise it will be undertaken by those not competent to perform it."

This was said in September, 1920, and, I believe, fairly voices the opposition to Potter's method at the present time. On the other hand, several men, after observing Potter's technic, have introduced it into their own obstetric practice, and published reports which mitigate against the "one-man" theory. M. P. Rucker of Richmond, Virginia, presented a series of two hundred cases, only one hundred and four of which he delivered personally, the remainder being performed by his associate, and his fourth year medical students. His results compare very favorably with those of any obstetric service—regardless of the technic used—and he stated that "the Potter version can be taught to students, it is easier to teach than the use of forceps." A number of other publications of results following the employment of the Potter method, have appeared in print, showing that it is being "tried out" even as far away as Cuba, and a detailed description of the technic together with a discussion of the history of version appeared last September in *Nederlandsch Tijdschrift voor Geneeskunde*, showing that interest in Potter's method is beginning to manifest itself in Europe. It is to be regretted that this Dutch author, C. C. Nijhoff, does not give any case reports, or otherwise indicate whether the method has actually been employed on the other side of the Atlantic.

In discussing one of Dr. Potter's papers, E. G. Zinke remarked that he believed it "the duty of every man who attends to the practice of obstetrics, and who intends to practice it in the future, to see Dr. Potter while he has an opportunity * * * his method of practice should not be lost. It is undoubtedly of benefit to suffering womankind. It helps the obstetrician, it saves suffering, it saves life."

It was in accordance with Dr. Zinke's idea that I made two pilgrimages to Buffalo and availed myself of the opportunity to see just how the operation was carried out in actual daily practice, to observe the condition of the patients both before and after labor, and to examine especially the effects of this form of delivery upon the fetus, as well as the general well-being of the child in after life.

I was greatly impressed by the ease with which Dr. Potter went about his work, the complete knowledge of anatomy which he displayed and his perfect mastery of every detail of the mechanism of labor. This could not fail to hold the attention even of one who was himself absolutely ignorant of obstetrics, and to anyone who has practiced and struggled with this art, his performance seems hardly short of marvelous. There was never the slightest suggestion of haste about anything he did, the utmost deliberation marking all his movements, yet I again and again saw a delivery completed in far less time than we are accustomed to use in merely "getting ready" for the second stage of labor.

My observations, however, did not stop with admiration for the man as he applied the method. The method itself made a very strong appeal to me. The technic used in dilatation of the perineum I realized at once could be profitably applied, not only when a version was contemplated, but in practically every form of delivery, and my experience, since making use of it in my own work, has fully confirmed that original impression.

After witnessing Dr. Potter's work, I resolved to apply his principles in my own practice because I felt confident that I could accomplish delivery with less trauma to the mother's soft parts than is practically always the case when forceps have to be used, and I also felt that the elimination of the second stage of labor greatly conserved the mother's strength, so that she could be carried through the puerperium much more comfortably, easily and quickly, in the majority of cases a consideration of the utmost importance to the patient and her family. Also from the viewpoint of the child's well-being I was convinced that the use of Potter's method gave far less chance of intracranial hemorrhage, so often subsequent to instrumental extraction or long delayed labor, and that the child's condition following every delivery I observed was quite as good, if not, indeed, better, than one sees in any good obstetric service, no matter what the technic employed.

In commenting on a paper read by Dr. Edward Speidel at the St. Louis meeting last year, Dr. Potter is reported as saying that he wished the author had given his own personal experience with the method and either advocated it or condemned it. I therefore take this occasion to give it as my opinion, based on my observations at

Buffalo, and my practical experience since using the Potter method in my own work, that the operation is in every way more rational than the application of high forceps, and is particularly applicable to those cases of dystocia wherein labor is so often allowed to continue until the mother's health is permanently impaired, or the child's life sacrificed because of the delay. But I do not regard it as a method to be used by the general practitioner, or the "occasional" obstetrician.

I wish to bring forward for consideration one hundred and fifty obstetrical cases, where the Potter method of version was employed, either throughout or, in certain consultation cases, after other methods of delivery had failed. As most of the controversy over this method is now being waged concerning fetal mortality I propose to lay especial stress upon this aspect of my cases, and to present tables, so that comparison of the results to the fetus in this and other midwifery practice, may be facilitated. I have also been at some pains to search recent medical literature for anything that may have been published concerning Potter's method, and a list of references will be found at the end of this paper, which I think includes practically everything written about it, with the possible exception of some of Dr. Potter's own papers, the substance of which, however, will be found in his recently published book.

It is only by such comparison that any just conception of the value or danger of the Potter method can be reached, and only by the publication of the results following its use by many different operators in different parts of the country, that we can obtain material upon which to base a final estimate.

All the cases in this series are personal ones. Before the version was attempted a careful external examination was always made to ascertain the exact location of the placenta and the relations of the fetal parts, to those of the mother, as well as to each other. This preliminary "mapping" of the territory about to be invaded is highly important. Vaginal examination is, however, in accordance with Potter's insistence upon the importance of absolute asepsis, carefully limited. The rectum and bladder must be absolutely empty, and to assure this it was usually necessary to catheterize the patient during the final preparations for operation, thus doing away with the frequent contingency of urine being left in the bladder after the patient believes she has voided its entire content. Dr. Potter claims that in his practice "injuries to the bladder do not occur because the bladder is always emptied before the version is begun, and lifted so high up that it is never even seen during delivery; therefore it is not torn off from its pivotal point of attachment at the internal os, nor from the descending rami of the pubes and ischium." It is my belief

that much of the success in maintaining the integrity of the birth canal, and avoiding injury to the mother's soft parts, which even its strongest opponents are forced to concede to the Potter method, rests upon painstaking attention to such preliminary details as this matter of insistence on a completely empty bladder.

Version was never attempted until the cervix was obliterated and the os either completely dilated, or in such condition as to be easily dilatable. When it was necessary to dilate artificially, it was accomplished according to Dr. Potter's practice, no bags being used in any elective case. The technic may be briefly outlined as follows:

The woman is placed upon a regular obstetric table, or if this is not available as high a table as can be procured is used for the delivery, the ordinary kitchen table serves excellently. The buttocks are brought to the edge of the table so that they even extend a trifle over it, the legs are lowered—in what is generally known as the "modified Walcher position" and supported by an attendant at each side. If no attendants can be mustered into service, the patient's feet are allowed to rest on two chairs, between which the obstetrician takes his stand. The external genitals are carefully shaved and scrubbed with soap and germicidal solution so as to render them as aseptic as possible, and the operator and assistants prepared as for attendance at any major intervention.

The selected hand. Dr. Potter always uses his left, covered by an elbow-length rubber glove is now introduced into the vagina, both glove and vagina being previously well lubricated with liquid green soap. What Potter designates as the "ironing-out process" is then begun, a single finger of the hand being first introduced as high as the cervix and then gradually drawn out, all the time keeping up firm unremitting pressure. Another finger is now added and inserted beside the first one in the same manner until sufficient dilatation is accomplished to permit access of the entire hand which "irons out" all the folds and adjacent rugae. The fully dilated cervix is then carefully stretched by the accoucheur's extended fingers until it is possible for the well-lubricated hand to enter the uterus. The operator's arm now blocks the lower part of the birth canal and a sterile towel is wound around it close against the vulva to catch the amniotic fluid which will escape when the membranes are ruptured.

If the head presents, the entering hand pushes it gently into the iliac fossa and passes upward, care being exercised to avoid the placenta. Assuming that the membranes are still unruptured, they are gently separated from the uterine wall by working the separated fingers up, down and around. The operator is now in a position to judge just how the child lies, how large it is, and the situation and approximate length of the cord. Locating both feet he seizes them between the first and middle fingers. If the feet are found to be locked at the fundus they must be carefully unlocked and the anterior foot brought down by gentle traction on the knee until it is within reach of the fingers, the second foot is then seized between the first and second fingers as before and brought down to the side of the first foot. The membranes will be ruptured when the feet are grasped.

Steady traction is now exerted on the feet, the operator's other hand at the same time gently pressing outside upon the mother's abdomen, in such a way as to urge the fetal head upward and outward. In some cases no outside pressure is necessary. When the feet and legs as far as the knees are exposed at the vulva, the version is accomplished.

The lower leg is now pulled upon until the child's pelvis is exposed; traction on this leg rotates the child's body so that the back is always uppermost, and at

this point in the extraction it lies directly transverse to the pelvic outlet. All the maneuvers just described are carried out with the utmost deliberation and gentleness but anyone who has had extended experience with the Potter method can usually accomplish the version in a very brief time.

When the fetal trunk is exposed it is my practice to wrap it in a warmed sterile towel to prevent the stimulating effect of a sudden change of temperature upon the skin, which is likely to make the child gasp and aspirate fluid. Very gentle traction is now exerted on the child's thighs until one of the scapulæ emerges from the vulva, the child's body being turned slightly as it descends so that it is drawn downward and backward. This brings the scapula beneath the maternal symphysis. When the scapula is in full view, the accoucheur pushes his hand above the shoulder and delivers it, thereafter rotating the fetal body so that the posterior shoulder comes into the anterior position, and is delivered in its turn, the body being supported from below by the operator's hand.

In his recently published book, (Fig. 25, p. 93) Dr. Potter advocates pushing the scapula under the pubic arch with the index finger instead of pulling the shoulder down, as was done in the deliveries which I witnessed. I have not yet had an opportunity of "trying out" this variation in technic. This rotation of the shoulders is one of the important features of the Potter procedure, as it avoids trauma to the perineum, and assists greatly in preserving the integrity of the birth canal.

The child's body now rests upon the flexor surface of the accoucheur's operating arm so that the child's chest rests in his hand, enabling him to observe the pulsations of the heart. One or two fingers are now cautiously inserted in the child's mouth, and very gentle traction exerted, the operator's other hand pressing lightly upon the occiput over the mother's pubes. This is perhaps the most "ticklish" moment in the whole procedure; too great pressure from without will push the head down between the shoulders, and extend the arms, a common technical fault in the older method of version. By delivering the shoulders before any pressure is brought to bear on the aftercoming head the danger of extended arms is overcome. Guided by the accoucheur's fingers in the mouth, great care being taken to avoid traction which might fracture the jaw, the head is now made to pass through the pelvis, flexion being fully maintained all the time. When the child's mouth and nose emerge over the perineum, the body is raised in order to permit any mucus to run out, and Dr. Potter's method of stroking the throat to assist in the discharge of any aspirated fluids, is followed. The head can now be allowed to rest on the perineum if there is need to further dilate the vaginal canal, as there is no danger now for either mother or child. Often the baby will gasp spontaneously, or even breathe and cry. Final delivery of the head is accomplished by lifting the child's body forward and up away from the perineum.

Delivery completed, the infant is placed on its right side upon the mother's abdomen, where it is left until all pulsation of the cord has ceased, after which the cord is clamped and cut. Following Dr. Potter's routine I give a hypodermic of one c.c. of pituitrin into the mother's thigh, immediately upon completion of delivery. The placenta will ordinarily be spontaneously evacuated in a few minutes, but if this does not occur the uterus can be emptied manually.

Rucker, in reporting his series of Potter versions states that it was "surprising to note the number of times the placenta separated by Duncan's method." In my series one hundred and one placentae were expelled with the lower edge in advance, while forty-nine followed Schultz's mechanism, practically a ratio of two to one. I do

not find that Potter himself has published any figures of placental separation.

There seems to be little doubt now that others can do this version, if not as skillfully as Dr. Potter himself, at least with sufficient dexterity to make it a safe and feasible operation in properly selected cases. Every one who has examined Dr. Potter's patients or who has used the procedure himself in a series of any size, declares that the postpartum condition of the mother is more generally satisfactory than in any other form of delivery; such statistics as are at present available appear to indicate that fetal mortality following or during delivery by Potter's method, is no higher than that attendant upon other obstetric technic. The remote effects upon the child cannot yet be justly estimated, as too few "Potter babies," outside of Buffalo at least, are as yet old enough to provide sufficient data for study.

Concerning the first two aspects of this question I have comparatively little to offer. The cases here discussed were all done by myself and I have not attempted to teach the method to others. As to how apt a pupil of Dr. Potter I have myself proved to be, I must let others judge.

In regard to maternal mortality and morbidity two mothers were lost in the series. One of these patients was a secundigravida, first seen at term, when she had already suffered several severe hemorrhages. Examination revealed a placenta previa centralis. She was immediately removed to the Baptist Memorial Hospital, where dilatation was effected by means of the de Ribes bag, and a living child extracted by Potter's method. The mother's reaction immediately after delivery was encouraging but at the end of about one hour she showed signs of profound shock, dying in a few minutes. There was no evidence of postpartum hemorrhage, nor did she suffer rupture of the uterus. I feel confident that had this patient been seen earlier before any hemorrhage had occurred, or even later, but before her condition became critical, that a skillfully performed version would have saved her life.

The other fatal case was also seen in consultation. The patient was a primigravida who lived forty-two miles from Memphis. Vain efforts to deliver with forceps under complete chloroform anesthesia had been made for several hours and heroic doses of pituitrin administered. When she reached the hospital after the forty-two mile journey, labor had been in progress for thirty hours.

On her arrival the fetus was found to be dead, with the head macerated, the position being occipitodextra posterior. It was decided that the interests of the mother could be best served by doing a Potter version, and this was finally accomplished. Great difficulty attended the actual turning of the fetus, the extraction was easily

accomplished. Immediate exploration of the uterus disclosed a rupture in the lower segment at the right side above the broad ligament. Laparotomy was at once performed and the uterus removed, but the abdomen was found to be filled with blood, and the patient died in about an hour.

I do not know whether the internal rupture resulted from the large doses of pituitrin, a not uncommon accident under these conditions, the fact that the body of the fetus was forced into the rent, controlling external bleeding during the long trip to the hospital, or whether the rupture occurred during my efforts to effect the version.

Had an immediate Porro cesarean been performed it would probably have greatly increased this young woman's chance of life. The version was undertaken in the hope that the possibility of future pregnancy might not be abolished.

Of the remaining one hundred and forty-eight mothers, forty suffered pelvic floor lacerations of the first degree, and twelve second degree lacerations. There were seven cases of placenta previa beside the one fatal to the mother, only one infant being lost. Two mothers suffered from pregnancy toxemia, but made satisfactory postpartum recoveries. One mother had encephalitis. There were no puerperal infections or any postpartum hemorrhages and, though two mothers suffered accidents before labor began which were in each case fatal to the fetus, they both recovered.

One hundred and six patients were primiparae, and only one had a family as large as four. This is interesting in view of the generally prevalent opinion in the older school of obstetrics that version should never be attempted in a first labor. Nineteen patients had had one previous abortion, and two had had four, six others had had two or three. Version was done on one hundred and twenty-one patients with normal pelves, while sixteen had more or less contracted pelves, twelve showed some degree of spinal deviation, and five had funnel-shaped pelves. The youngest patient was eighteen, the oldest forty-two; thirty-seven, almost twenty-five per cent of the series, were thirty years old or over. Comparing the age of my patients with those of others who have employed Potter's method, I find my average age is greater, and would call attention to the fact that in elderly primiparae especially, version seems to give excellent results, for it is in this class of cases that the obstetrician usually anticipates serious lacerations.

Considering the effects of this form of delivery upon the child, Dr. Potter's chief claims in this regard are that eliminating the often greatly extended second stage of labor and the absence of instruments, does away with the likelihood of traumatizing the baby's head,

or any of the usual compression injuries. More than fifty years ago it was demonstrated by Sir James Young Simpson that in cases where the head is very large or the outlet contracted, extraction is easier and the child's chance of life and a normal mentality greatly increased if the head comes last rather than at the outset of delivery. The after-coming head can be greatly flattened and extended and yet make a perfect recovery.

The duration of labor in my series was from six to fifty hours, version being done at the beginning of the second stage in seventy-three, and where the second stage had been for some time in progress, in seventy-seven. When version is the selected form of delivery, and undertaken as soon as complete dilatation is accomplished, the results are best for both mother and child.

Table I shows the relation of fetal death to the shape of the mother's pelvis.

Table I

Showing Relation of Pelvis to Infant Mortality

	NORMAL PELVIS	FLAT CONTRACTED	FUNNEL	KYPHOSIS (NOT CONTRACTED)	TOTAL
Breathed spontaneously and lived at least 14 days	97	11	4	10	122
Resuscitation necessary, lived at least 14 days	11	0	0	0	11
Died in the first 14 days	6	3	1	0	10
Stillborn (not macerated)	6	2	0	1	9
Macerated	1			1	1
Total	121	16	5	12	153

Four cases of normal pelvis counted twice on account of twins.

It will be noted that ten babies were born dead, and eleven died within the first fortnight. Two of these stillborn infants were in consultation cases after forceps had been used, and were dead before admission to the hospital; three were monsters; one died because of antepartum toxemia, and one was a case of prolapsed cord where the mother refused assistance until the fetus had perished. Two babies died during the process of delivery; in both these cases, elderly primigravidae with large fetuses, both version and extraction were most difficult. The pelvic measurements were normal, however, so that viewed conservatively, there was no indication for cesarean section, but I am

now inclined to believe that had section been elected these children might have been saved.

The infant noted on the table as "macerated" was born at term, following a normal pregnancy. The mother, a primipara, aged twenty-five, a few days before the expected date of delivery, fell down a flight of stone steps, and rolled some distance upon a concrete driveway. Although she suffered some pain, she was of a rather phlegmatic disposition, and was not sufficiently alarmed to inform me of the accident. No external bleeding immediately followed the fall, but she felt uncomfortable for two or three days, or until the membranes ruptured. Following the rupture of the membranes she was sent to the hospital, although labor did not set in for thirty hours thereafter. At entrance the abdomen was very tense and no fetal heart sounds were audible. The patient stated that she had not felt any movement since the accident.

Dilatation was fully accomplished about twelve hours after the onset of labor, with moderate bleeding during the first stage. Version was performed in the interests of the mother, and upon delivery of the placenta a number of small blood clots were observed to be adherent to it, the evidence of a classic accidental hemorrhage, abruptio placentae. In this case cesarean section immediately following the accident would probably have saved the child's life.

Of the eleven infants dying within the first two weeks there was one set of syphilitic twins delivered at the thirty-fourth week who lived two hours; another premature baby, thirty-six weeks, delivered of a toxic mother, lived twenty hours. Still another, the mother being injured in an automobile accident at the thirty-fourth week, lived two days; and another, delivered in the thirty-sixth week, the mother suffering from encephalitis, lived seven days.

Of the infants born at term there were two cases of melena neonatorum living thirty-six and forty-two hours respectively; two others with patent ovale, one living five days and the other six; and one child with an enlarged thymus gland who died on the second day. One baby died on the second day from morphine poisoning. Forceps delivery had been attempted in a neighboring town and the patient was kept under heavy doses of morphine until she could be conveyed to the hospital in Memphis. The baby lived eighteen hours.

The proper administration of the anesthetic is one of the prerequisites to a successful version according to Potter's method. Dr. Potter's patients are all anesthetized by his co-worker, Dr. Reynolds, and Rucker, in his report, remarks, that after having some experience with various kinds of anesthetists, he "can see the importance of such an arrangement." I am fully in accord with Rucker's conclusions. In my work I have employed ether rather than chloroform,

despite Dr. Potter's preference for the latter. While ether does not anesthetize so quickly as chloroform it is more uniform and lasting in its effects. I have laid especial emphasis on this, because I believe it is better for the patient to remain quiet for a time after the ordeal of labor, and I see no advantage in having the mother regain consciousness immediately after delivery. Dr. Potter has mentioned the advisability of withholding the anesthetic during delivery of the fetal trunk, to permit natural uterine contractions to aid in the ex-

TABLE II

ANALYSIS OF CASES WITH SPECIAL REFERENCE TO NEONATAL MORTALITY

		NO. OF CASES	INFANT MORTALITY
Parity, previous children	0	106	12
" " "	1	36	6
" " "	2	6	2
" " "	3	1	1
" " "	4	1	
Previous Abortions	0	123	15
" "	1	19	2
" "	2	4	1
" "	3	2	2
" "	4	2	1
Pelvis, normal		121	13
" flat contracted		16	5
" Funnel		5	1
" Kyphosis		12	2
Position, O. L. A.		33	2
O. D. A.		15	1
O. L. P.		32	5
O. D. P.		56	11
Brow		2	
Breech		11	2
Shoulder		1	
Separation of Placenta, Duncan		101	9
Schultze		49	11
Condition of Infant, Breathed Spontaneously		122	
Resuscitated		11	
Stillborn (not Macerated)		9	9
Macerated		1	1
Premature		5	5
Enlarged thymus		1	1
Heart disease		4	4
Morphinism		1	1
Monstrosity		3	3
Maternal Complications, Prolapsed cord		1	1
Placenta previa		8	1
Toxemia of Pregnancy		2	1
Abruptio placentae		1	1
Ruptured uterus		1	1
Encephalitis		1	
Duration of Labor, 6 hours		5	2
10 "		10	1
12 "		16	7
15 "		44	4
18 "		24	4
20 "		38	2
30 "		10	1
50 "		3	

TABLE II—Cont'd.

AGES	CASES	AGES	CASES
18	1	30	8
19	4	31	8
20	3	32	7
21	13	33	2
22	6	34	5
23	16	35	1
24	12	36	2
25	13	37	1
26	15	39	1
27	5	40	1
28	8	42	1
29	14		
Labor Induced		2	
Dead before delivery and in interest of mother		8	
Fetal heart stopped before attempt at delivery		2	
Operation done at onset of second stage		73	
" " late in second stage		77	
Maternal Deaths, placenta previa		1	
Ruptured uterus		1	
Laceration of Pelvic Floor, first degree		40	
" " " " second stage		12	

pulsion, but my anesthetist keeps the patients under full surgical anesthesia throughout, and I found when this is done I have absolute control, and by making gentle traction can accomplish a successful extraction. I have occasionally used chloroform, but cannot see that it offers any advantage over ether, which is universally conceded to be the safer anesthetic for routine employment.

There were no infections in any case in this series, nor any post-partum hemorrhages. Where version was done early in the second stage of labor, it was selected as a means of delivery because of a diagnosis of posterior position, and in accordance with my belief that if the operation is carried out early in the second stage we get far less injury to the baby's head, and a shorter and more satisfactory convalescence for the mother.

In some of my early cases, I had very great difficulties, but I believe now that most of my trouble was due to my making the extraction too quickly. Dr. Potter's rapid slowness, if I may use a contradiction of terms, has only been acquired by vast experience, and too hasty extraction is a mistake likely to be made by those who try to do the delivery in record time.

I have not yet had time to judge the remote effects of this obstetric procedure. The mothers, however, undoubtedly have a more rapid involution of the uterus, with earlier cessation of the lochia, the secretion of milk, as a rule, is active, and the patient seems to have a general sense of well-being, greater than when delivery has been accomplished by other methods. Pelvic examination eight weeks after labor always shows the birth canal to be in excellent condition, and in

general, a year or more after, there are far fewer sequelæ than we should expect to follow operative delivery.

In conclusion: Potter version is not indicated as a routine practice in every case of labor, and it should not be undertaken by the general practitioner nor the occasional obstetrician. It is, however, far more rational and scientific than the application of high forceps, and is certainly indicated in cases of dystocia when prolongation of labor may work permanent physical injury to the mother or result in death to the child. Performed by those experienced in its application, and with proper indications, it is an obstetric procedure of the greatest value.

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CASE REPORTS

By Irving W. Potter, M.D., Buffalo, N. Y.

Mr. Chairman and Gentlemen:

The following cases I believe are of sufficient importance to warrant this brief report.

Case I.—Mrs. L., aged twenty-three; para II; married; white; pregnant, expected time of delivery March 27, 1922. Family History—father dead, cause unknown; mother living; sisters, 1 living. Brothers, 1 living. Present history—menstrual periods had always been regular up to time of pregnancy. Some nausea and vomiting during pregnancy; ankles and feet somewhat swollen at night; urine negative. Blood pressure, systolic 125; diastolic 90. No headache nor disturbance of vision. Complained more than usual of being tired each night but thought that condition was due to unusual size of abdomen.

Went into labor during the afternoon of February 17, 1922. Pains irregular but hard. Seen about 8 P.M. at her home. Cervix fully dilated; membranes unruptured; abdomen greatly distended, much more so than one would expect at eight months. Her breathing was short and difficult, although her color was good; and there was no difficulty in swallowing.

Was taken to hospital about 9 P.M. and given the usual preparation for delivery, pains at that time being hard and regular, with some bloody show. She was taken to the delivery room and chloroform anesthesia begun by my regular anesthetist. She took her chloroform well and when sound asleep I carefully ruptured the membranes, after preparing to catch the amniotic fluid for purposes of measuring, and secured eight quarts by measure.

I then delivered her by version of a female child—a monster of the anencephalic type with double club feet and spina bifida. Without any alarming hemorrhage the placenta was delivered, and without any warning the patient stopped breathing—her heart continuing to beat for a short time. All attempts to reestablish respiration were of no avail, and the patient was dead just 17 minutes from the time she was placed on the table. The amount of Squibb's chloroform used was less than two drams.

The following is the report of the postmortem performed by Dr. A. A. Thibaudeau.

Report on autopsy made on body of Mrs. L. at the Homeopathic Hospital, Feb. 17, 1922:

External examination shows nutrition fairly good; abdomen flaccid; marked lividity, particularly in dependent parts; rigor mortis not observed.

On section the peritoneum is found somewhat congested; no abnormal amount of fluid in abdomen.

Pleural cavities free of adhesions.

On removal of the sternum, the thymus, somewhat larger than a good sized hen's egg, is found in the mediastinal space.

Heart:—Moderately dilated; on section found to contain fluid blood. Valves apparently normal.

Lungs:—Left, cut section exudes bloody froth. Right, same as left.

Spleen:—Slightly enlarged, cut section somewhat soft.

Kidneys:—Left, cut section drips blood, congested. Capsule strips readily. Right, same at left.

Suprarenals:—Apparently normal.

Liver:—Somewhat engorged; cut section dark, drips fluid blood.

Uterus:—Very large and flaccid (not contracted after delivery). Cut section shows roughened surface corresponding to placental site. Cervix dilated fully.

Ovaries apparently normal. Right contains large corpus luteum of pregnancy.

Urinary bladder normal.

Thyroid markedly enlarged.

Mesenteric and retroperitoneal glands are markedly enlarged.

Anatomical Diagnosis: status lymphaticus; dilation of heart; congestion of lungs; congestion of abdominal organs; uncontracted uterus.

I had previously delivered this patient of the same type of monster.

Blood Wassermanns on her husband and herself were negative.

Case II.—March 22, 1921, I saw with Dr. Dignen of Buffalo, N. Y., at the Homeopathic Hospital, Mary B., married; aged nineteen; pregnant at term, with eclampsia and having convulsions. She had been sick 24 hours and did not regain consciousness between her convulsions. She had been treated medically in the hospital with no results. Vaginal examination showed cervix admitting one finger, and thick membranes unruptured; fetal heart heard; blood pressure, systolic 200; diastolic 150.

She was prepared for abdominal cesarean section and I delivered her of a female child, weighing 7 lbs., which lived 12 hours. Patient regained consciousness, having three postpartum convulsions during the following 48 hours and made a good recovery—her abdominal wound healing under the first dressing.

I was engaged to care for her again March 6, 1922. During this pregnancy the patient showed none of her previous symptoms. Her expected time was Aug. 1, 1922. She was told to notify me at once at the onset of labor but failed to do so.

During the evening of July 29, 1922 she was taken with slight pains, gradually becoming more severe. She went to the Homeopathic Hospital herself, reaching there about 5 A.M., July 30, 1922; she did not appear to be suffering greatly, and I saw her about 9 A.M. I noticed at once a peculiar swelling about 5 or 6 inches long, and 2 or 3 inches in breadth at the site of the abdominal scar. This swelling was soft to the touch and not painful in any way. Upon percussion it was dull. I made a diagnosis of rupture of the uterine scar, with either a placenta presenting or a bag of waters.

She was prepared for operation, and making a careful incision through the abdominal wall down to the peritoneum I carefully opened the peritoneal cavity, and found the membranes protruding through the first uterine scar which had opened its entire length. There had been no apparent bleeding. I did not have to enlarge the opening in the uterus, but simply separated the membranes in the usual manner before rupturing them, and delivered a live female baby, weighing 8 lbs.

The placenta being on the posterior uterine wall I then cut out the old scar in the uterus, sending the scar tissue to the laboratory, and closed the uterus with two layers of chronic gut, bringing the uterine peritoneum over the incision with No. 2 plain catgut, resecting both tubes and closing the abdomen in the usual manner. Both operations were above the umbilicus. Patient made an uninterrupted recovery, and left the hospital in two weeks with her baby—with no signs of kidney disturbance.

Dr. Roman of the Buffalo General Hospital gave me the following report:

Laboratory findings of scar tissue.—The examination of the muscle tissue taken from the margin of the defect of the anterior wall of the uterine fundus shows the uterine muscle fibers to be partly crowded out by a marked increase of the interstitial tissue. The latter is partly hyalinized and partly cellular, especially toward the margin where the picture is like that of a chronic granulation tissue. Throughout, the tissue shows marked vascularity (dilated capillary vessels) and closely set foci small cell infiltration. The muscle fibers, inasmuch as they are retained, show no changes but those of a hypertrophy of pregnancy.

PITUITRIN IN THE SECOND STAGE OF LABOR

By Magnus A. Tate, M.D., F.A.C.S., Cincinnati, Ohio

"PROGRESS in endocrinology can at best come only slowly and, to quote Rowntree, through correlated, adequately controlled investigations in which the findings are subjected to interpretations based on analytic and critical judgment. Endocrinology needs a leadership willing to admit the magnitude of its shortcomings. Its real contributions will then become more evident." Jour. Am. Med. Assn., July 22, 1922.

Along this line of thought a question of import to obstetricians is, whether it is wise and safe to use one of the endocrines, namely pituitrin, in the second stage of labor, and I bring this before you for your earnest consideration, not from the experimental but the practical standpoint. Thinkers and doers in medicine (according to the remarks made in a symposium at the last meeting of the American Medical Association), believe that many hurried claims *pro* and *con* have been made for the endocrines, which at the present time have not been substantiated. The reporting of remarkable results after meager experience, or the repudiating of certain of the endocrines with such statements that they are ineffectual or dangerous, is not convincing, and it seems to me, that we must look to future experimental, clinical and research work to elucidate the good or bad of the ductless glands. Query—are we collecting reliable data, or simply making statements without studying our own and other cases in detail from all angles?

I find that there is quite a divergence of opinion as to pituitrin, especially so when used in the second stage of labor, some stating that it is often accompanied and followed by serious consequences, others that if judiciously and obstetrically used, it is one of the remarkable discoveries of the age.

Pituitrin for obstetrical use is on the market as an aqueous extract from the posterior lobe of the pituitary body, ready for hypodermic use, and the dosage ranges from 0.5 to 1 c.c., to be repeated in half an hour, if in the judgment of the physician it is called for. This posterior lobe is described as a complex body, and when injected, causes or increases muscular contractions of uterus, strengthens and slows the heart beat, and by its contracting action on the arterioles raises the blood pressure. I use from 0.25 to 0.5 c.c., repeat once if necessary and never use over 1 c.c. in a given case, and in my experience pituitrin seems to be an ideal adjunct.

From the literature at my command however, where pituitrin was

used in the second stage of labor, I find cases reported where the child was said to be asphyxiated, others where there was undue compression of body of child, cases of cerebral hemorrhage, separation of placenta, extensive lacerations of cervix and rupture of uterus. Some infants born alive developed paralysis and others became idiots and epileptics. I also find it stated that uterine tetany might occur following very small dosage.

The complications and sequelae mentioned above are of such import, that I bring up the question at this time, (knowing that many thousands of cases have had pituitrin administered to them during the second stage of labor), why such reported results should occur and what explanation can be given as a solution.

Is there some peculiar idiosyncrasy on the part of some pregnant women to pituitrin, is the fault in the preparation of the drug, is the dose or repeated dosage too large, are the indications for its usage properly considered, does patient's condition warrant its use, can its action be relied upon, and are not some of the complications attributed to pituitrin erroneously reported?

Time and clinical experience are the essentials necessary to assure us, that either we have something of great value, or that pituitrin should be classified as a dangerous drug and unworthy of use when administered during the second stage of labor. I note that many who use pituitrin extensively have become enthusiastic, and that they even go so far as to state, that to a great extent, it takes the place of forceps, without the frequent resultant effects of instrumental trauma.

It is necessary to have in mind, that there are definite contraindications, and they may be enumerated as follows: incomplete dilatation of the os, nonengagement of presenting part, any mechanical obstruction to delivery on the part of pelvis, uterus, bladder, vagina, rectum, or of child, any disproportion of fetal or pelvic measurements, abnormal presentations, uterine inertia following a long and harrowing labor, the patient being thoroughly exhausted; especially is this so in the tuberculous and syphilitic.

Its usage may be summed up as follows: it starts, renews or increases feeble contractions of uterus in suitable cases.

That pituitrin used indiscriminately may be a contributing or even the main cause of one or more of the above-mentioned complications is self-evident to the intelligent. It is not convincing, however, to read some of the case reports where pituitrin is put down as the cause of an unusual complication or of death of patient.

Such criticisms without complete histories of pertinent facts or condemnation of the drug when erroneously used, are of little value from a statistical standpoint of the merits or demerits of the drug in

question, and leaves those seeking enlightenment in the same position as before perusing such reports.

It is only rational to say, that if midwives are allowed to administer pituitrin, disaster will follow in many unreported cases, and if physicians discard obstetrical contraindications, serious complications will ensue, and especially is this so, if used in every case where there is the least delay, regardless of presentation or position, or where there is a temporary cessation of labor pains with the os only partially dilated.

It is of little moment whether one decries those who condemn pituitrin in the second stage of labor, or praises those who consistently use it, but it seems to me that obstetricians are called upon to give their unbiased opinions of pituitrin, based upon their own experience, so that some definite conclusion may be reached, which will be of value to the profession at large.

I have used pituitrin in the second stage of labor for a number of years, and during the past year in 30 selected private cases, and after mature thought and careful observation have come to this conclusion: that if used judiciously from an obstetrical standpoint, it is a boon to motherhood.

10 West Seventh Street.

DISCUSSION

DR. EDWARD SPEIDEL, Louisville, Kentucky.—From being an earnest advocate of the use of pituitrin, I have become a very cautious and occasional user of the drug, not from any fear of its effect, or any doubt of its efficiency, but from the fact that the occasion now arises less often to use the drug. No woman should be allowed to become exhausted during a long continuous labor. If we have a long continued first stage the woman can be given a well earned rest by a narcotic. If she has an ineffective second stage of an hour or two hours, you should resort to direct methods. In a multipara with a relaxed perineum you perhaps may resort to small doses of pituitrin, and I say small doses because you can never tell how the drug is going to act, and if you use pituitrin at all, you should use the same brand of pituitrin at all times in order that you may become acquainted with the comparative strength of that kind of pituitrin. In primiparae we have much better methods to assist with labor when it seems to lag. We can use full surgical anesthesia, dilatation of the perineum as brought out by Potter, and the application of forceps in delivery as compared with the doubtful result that may happen with small or with large doses of pituitrin.

DR. GRANDISON C. ROYSTON, St. Louis, Mo.—Pituitrin is a valuable agent in shortening the third stage of labor, I think most of us agree as to that. That it is a dangerous drug is also well known. The point of Dr. Speidel should be well taken. We should start with a small dose and with the same preparation with which we are familiar. We begin with two minim doses. Some patients seem to have an idiosyncrasy toward pituitary preparations. We cannot say always what effect two minim doses will have on one patient, and what effect it will have upon another patient unless at the time the dose is given the hand is placed on the uterus and one feels the uterine contraction. After a two minim dose during the second stage, I have observed a tetanic contraction of the uterus which lasted 13 minutes. The fetal heart beat dropped from 120 to 80. I feel that the baby in

this case would have been asphyxiated had the tetanic state of this uterus not been forced to relax. I have had four instances where anesthetics were necessary to stop the tetanic contraction of the uterus following two minim doses of pituitary injections. I have had two cases of stillbirths attributed to the pituitrin in doses of less than five minims.

DR. ADAM P. LEIGHTON, JR., PORTLAND, MAINE.—The indications and contraindications mentioned we all agree to, but there is one of which he did not speak and which I would like to mention. I believe there is great necessity for a thorough knowledge of the past history of the woman, that is, any question as to rheumatic fever or scarlet fever, or myocardial disturbance. It is of the utmost importance that we should know about this. I never use pituitrin or pituitary extract in any dosage over four minims, and only in multiparae. I recently had a women under my observation from the fourth month of pregnancy. She was a healthy looking individual. I took her blood pressure and examined the urine regularly. When she went into labor I was called to see her; I found she had a three-quarters dilated os and good engagement. I gave her four minims of pituitrin. While I was putting on my apron and gloves I heard deep breathing. I turned around and found the woman was cyanosed. There was mucus coming from the mouth and she was dead. I looked for a knife; and the husband did not have a pocket knife, so I got my forceps out and delivered the baby. It has taught me a lesson however, and I always inquire now as to whether or not there is any possibility of myocardial disturbance. We should always bear in mind a history of rheumatic fever or of scarlet fever on account of the possible incidence of cardiorenal disease. I have come to realize that pituitrin, while a most valuable obstetrical adjunct, is also a very dangerous drug.

DR. H. WELLINGTON YATES, DETROIT, MICHIGAN.—Some two years ago I was called to a patient whom I had confined two or three months previously, and this was her first menstruation after that event. She was flowing so freely, that her husband, a doctor, thought her life was in jeopardy and not having ergot at hand he gave her one ampoule of pituitrin. Within a few moments she had difficulty in breathing and became cyanotic. He could scarcely get her pulse; she felt faint, vomited, and had definite symptoms of anaphylaxis. He administered 10 minims of adrenalin, I was at his house in fifteen minutes and there had taken place that which we might have anticipated if our view of anaphylaxis had been true. I mention the use of this drug as a possibly dangerous one from its anaphylactic effect as well as the one for which it was intended and next to elicit any further comments that may be made concerning these phenomena. I referred this matter to the head of the Biological Department of Parke, Davis & Company, and he went into a very careful consideration of the question and assured me that there was but an infinitestimal portion of a grain of the proteid in each ampoule of the product and that he could scarcely believe it was anaphylaxis in this case, but it had seemed to us quite different.

DR. SAMUEL A. COSGROVE, JERSEY CITY, NEW JERSEY (by invitation).—There are one or two considerations which I think ought to bear on the discussion in reference to the use of pituitrin. Any obstetric consultant cannot but be impressed with the lack of consideration of the specific contraindications that Dr. Tate has mentioned, in the hands of the average general practitioner, and the not infrequent tragic outcome which may result from disregarding these contraindications. Also, if Dr. Tate's contraindications are clearly applied, there will be only a small residue of cases which need pituitrin; and if in addition to the rigid application of Dr. Tate's contraindications we make allowance for a margin of error in estimating some of these contraindications even by good men, the number in which pituitrin is properly indicated will be still further reduced. In that small

number of cases it seems to me that the substitution of anesthesia and mechanical relief, with its entire elimination of pain and psychic shock, is very much preferable to the increase of the woman's pain incident to the use of pituitrin, even though the period of that pain is lessened, and certainly the simple mechanical measures necessary in the small group of cases in which pituitrin could be properly used would not be conducive to any considerable trauma.

DR. JAMES K. QUIGLEY, ROCHESTER, NEW YORK.—Some eight years ago I became rather enthusiastic over pituitrin, so much so as to report in two papers my results, and I have no reason yet to regret my early enthusiasm. I started with small doses and I use about two minims now. I do not use quite as much as I did. I apply forceps more often now than then. In using pituitrin one should have an anesthetic and forceps available, which usually means it is a hospital case. I feel like Dr. Tate with rigid indications, and bearing in mind the rigid contraindications, we can still give pituitrin in the second stage of labor.

DR. FRANCIS REDER, ST. LOUIS, MISSOURI.—In speaking of pituitrin I am not going to refer exactly to pituitrin as indicated in labor. I wish to cite a case that came under my observation recently. I was called in consultation by an able physician who had made a diagnosis of hydatid mole in a woman having a tumor reaching to the level of the umbilicus. Rapid growth and loss of blood occurred repeatedly. Upon these features the doctor based his diagnosis. In examining the abdomen I found that the mass extended higher on the right side than on the left; she had been sick in bed for a week. It was decided to operate. I went about this operation very cautiously as I had not entirely dismissed the possibility of a pregnancy. Upon opening the abdomen a uterus presenting all the aspects of pregnancy was found. I could get the fetal head well into my hand, but on account of the large amount of amniotic fluid I did not succeed in palpating the body of the child. I delayed operation purposely, being desirous to know whether the fetus was alive or dead. There were no movements. The abdomen was closed. I had trusted that my manipulations would be sufficient to bring on uterine contractions and expulsion of its contents. They did not. Two weeks later, after the abdominal wound had become securely healed, three bougies were introduced to stimulate the uterus to contractions. Much to my surprise, a week passed before any contractility of the uterus took place. These contractions were very weak. In removing the bougie and the tampons, I found the os sufficiently dilated so that I was able to extract the child. There was considerable bleeding. You might call it a hemorrhage. Ergot was given by mouth and hypodermatically with no encouragement. I had recourse to pituitrin. It was used with great caution. A half ampule caused only moderate contraction. Two hours later the other half was given which caused a firmer contraction, so much so that with the aid of an intrauterine tamponade the bleeding was checked. The pituitrin was not repeated, but the tampon was kept in place. For a week this woman was very sick. She was not toxic, although symptoms of absorption manifested themselves by a chill and fever of 104° four or five hours before delivery took place. I do think that this patient was benefited by giving her pituitrin.

DR. TATE (closing).—If the members of the Association will read the literature on pituitrin, as I have done in the last six months, they will find scattered throughout, numerous cases reported where pituitrin is put down as the cause of some complication or death of the patient. I cite one case to illustrate. The patient was an Austrian woman who had a normal first pregnancy and labor. With the second labor, a midwife was engaged. After being with the woman thirteen hours and there being absolutely no progress, the midwife began to give pituitrin with the result that rupture of the uterus followed, the woman was hurried to the

hospital, the uterus removed, and the patient died. This death was put down as one due to pituitrin, and yet an obstetrician would know that it was a case in which pituitrin should not have been used. You will find many such cases reported throughout the literature.

Another thing that strikes me as being rather peculiar is this: I hear men speak of the dangers of pituitrin in society meetings, and yet they use pituitrin in their practice.

I have never had any cases like those reported by Dr. Royston, and let me repeat, I would not think of using pituitrin in every case I encountered, but select my cases. The case has to be, as far as I can make out, a normal one. I would not, for one instance, think of giving pituitrin to a patient who had rheumatism, with a heart lesion so bad that she had to sit up in a chair, and in the second place, when I give a patient pituitrin, she is in bed or on the delivery table, not walking around the room.

SHOULD PUBIOTOMY BE RECOGNIZED AS A JUSTIFIABLE OPERATION IN OBSTETRICS?

By Arthur H. Bill, M.D., Cleveland, Ohio

VERY little mention has been made during the recent years of the operation known as pubiotomy. This operation was never popular in this country; in fact, we may say that in only very few of our clinics was it given what might be called a fair trial. Many obstetricians rejected the procedure before using it, while others apparently did not meet with success on attempting it, or at least the procedure did not appeal to them. We may say that pubiotomy has had a rather rough road to travel on its way to finding a place of recognition as a valuable obstetric procedure.

Probably one of the underlying reasons for discrediting pubiotomy is the fact that its proper place was not fully realized and that there was always a tendency to compare it with cesarean section, as if the two operations were competitors, in which case opinion invariably and very rightly remained favorable to cesarean section. The fact should be made very clear that pubiotomy in no way competes with cesarean section; in fact, its advantage is seen in those cases in which we know that cesarean section is either contraindicated or its performance is an impossibility. It competes chiefly with craniotomy on the living child, and in this connection it may be said that it makes little practical difference whether the physician deliberately perforates the head of a living child, or, knowing that its successful delivery is impossible, makes brutal traction with forceps until he finds that there is no longer a fetal heart and then perforates the head. The writer believes that craniotomy is used far too often; in fact, that it is very seldom necessary.

In the last decade, we have seen some wonderful changes in obstetric practice, so much so that today obstetrics is on a far more scientific basis than ever before. We have shown that it is possible by the proper administration of analgesia and anesthesia to make labor quite comfortable and do that without interfering with its most successful termination. We have learned that it is possible to shorten the second stage of labor with safety. We have adopted the practice of correcting abnormalities of presentation and position instead of waiting indefinitely for Nature to correct them, because in a certain percentage of cases spontaneous change to a normal position takes place, but perhaps after many hours of unnecessary labor. We have learned to make rectal examinations during labor instead of vaginal

examinations, thus further decreasing the possibility of infection. We have seen that it is possible to reduce the maternal mortality in cases of antepartum hemorrhage, for example, placenta previa and accidental separation of the placenta to an almost unbelievable minimum by the proper employment of transfusion with the delivery. We have seen a very marked reduction of severe postpartum hemorrhage by the routine administration of a pituitary preparation, immediately after the birth of the child. We have seen a broadening of the field for cesarean section so as to include quite a variety of conditions, and yet we have learned more fully its limitations. We have been impressed more and more with the fact that there is great risk in performing a cesarean section in cases in which any attempt at delivery or any vaginal manipulation has been made, where any vaginal examination has been made or even when the patient has been in labor too long. In fact, the conditions mentioned are considered contraindications to the use of cesarean section. But in spite of all the advances in obstetric procedure, we still have craniotomy. In overcoming the necessity of performing the latter operation, pubiotomy finds its place.

It is undoubtedly true that were the best judgment used in the management of cases from the beginning, there would seldom be an indication for pubiotomy. That is, if the most accurate estimation of the relative size of the fetal head and the bony pelvis were made, and if only rectal examinations were made during labor, and the patients not allowed to continue in labor too long, in other words, if the cases were always kept as what we term clean cases, cesarean section could be safely performed when occasion arose. But unfortunately, in a certain percentage of cases, this is not true. In these, the patients are allowed to continue in labor in spite of dystocia due to the bony pelvis, repeated vaginal examinations are made, as is still the custom of many physicians, and even unsuccessful attempts at delivery. In these so-called potentially infected cases, we all realize the risk of performing a classical cesarean section and we might well add that the various methods of extraperitoneal or transperitoneal cesarean section have not materially lessened the danger in such cases. In these cases the fetal heart may still be good and the justification for performing a craniotomy cannot be shown. Pubiotomy gives us a means of delivering a living child and there are not the contraindications to it which there are to cesarean section. There is no invasion of the peritoneum or of the uterus and not frequently even a communication between the pubiotomy wound and the vaginal tract. There is, in other words, no more reason why pubiotomy should be contraindicated than craniotomy in a potentially infected case. The justification of pubiotomy as an obstetric operation may

be determined by the ultimate results, which involve chiefly the question of the character of the union of the pubic bone and the functional results obtained, inasmuch as, the various complications which have been reported and are of a permanent nature may be avoided by care in the performance of the operation. In my own experience, there has always been firm union of the bone, but this is in most cases a fibrous union. Radiographs taken at times varying from one to twelve years after the operation have shown in most cases fibrous union with slight separation of the bony surfaces, while in one case, there was such a perfect bony union that it was scarcely possible to determine from the radiograph on which side of the symphysis the cut had been made.

The functional results were, however, uniformly good whether a fibrous or a bony union resulted, the patients being unhampered in the performance of their respective duties, which varied from the work of a scrub woman to the strenuous exercise of the athletic woman.

Probably the most striking advantage of pubiotomy is shown in the delivery of the aftercoming head by the use of what has been termed the prophylactic saw. When the fetal head is at the fundus, as in the case of a primary breech presentation, and there is a moderately contracted pelvis, the obstetrician is in a very disadvantageous position. Pelvic measurements are after all only relative, and measurements of the fetal head as it lies in the fundus are inaccurate. The real estimation of the possibility of the head passing through the brim of the pelvis can only be made when the head is presenting and one can determine the relative size of the fetal head and bony pelvis. In some cases the obstetrician comes to a full realization that the fetal head will not pass through the brim only when he has reached the stage of the delivery of the aftercoming head. He is then helpless. If, in cases in which there is uncertainty in regard to dystocia, the prophylactic saw is passed around the pubic bone before the delivery, and simply allowed to lie in place without sawing, it is possible to release the fetal head in time to save the child if an absolute obstruction is found. If the aftercoming head is delivered without difficulty, the fact that the saw has been passed is in no way harmful to the patient. The same procedure may apply to cases in which the best judgment of the obstetrician tells him that he may be able to deliver a child by means of podalic version better than by forceps. If his judgment fails him, and the aftercoming head does not enter the pelvis, he will be very glad to have a prophylactic saw in place. One more example of the peculiar value of pubiotomy is seen in cases of contracted pelvic outlet. If the fetal head has

been brought down to the outlet and there has met an obstruction, pubiotomy offers the only means of delivering it.

I have made no attempt at giving an exhaustive description of the operation of pubiotomy with which you are all undoubtedly familiar; have said nothing of the history or bibliography, nothing of the technic, and have not bothered you with case reports, though I might add that I have performed pubiotomy operations successfully in all of the varieties of cases mentioned. My intention has been merely to emphasize the fact that in certain cases, pubiotomy offers us something which no other obstetric procedure can replace. Let me make it perfectly clear that I do not consider pubiotomy to be an elective procedure, but merely an emergency operation, to be applied in those cases in which the child cannot be saved by other means without seriously endangering the life of the mother. I would not even advocate a broadening of its field and would especially speak against reckless performance of podalic version in cases of contracted pelvis under the safeguard of the prophylactic saw. In view of the peculiar advantages of pubiotomy, as described, and the favorable results, and in spite of the fact that the procedure *per se* is not especially attractive, can we not conclude that it deserves to be given a definite place among our valuable obstetric procedures?

503 Osborn Building.

DISCUSSION

DR. ADAM P. LEIGHTON, Portland, Maine.—If pubiotomy is a "competitor of craniotomy," then I believe it has no place in obstetrics because craniotomy is a confession of carelessness, inattention, and lack of skill. The indications for pubiotomy are none other than can be met with version, the induction of labor or cesarean section. I am not a believer in pubiotomy, and it has no place in rational obstetrics.

DR. JOHN OSBORN POLAK, Brooklyn, New York.—Dr. Leighton's remarks are particularly good if we can always control our prenatal work; but to those of us who are unfortunate enough to have services where every bit of bad obstetrics in the locality is tossed to us, it is a question of deliberately sacrificing the child or letting the woman go until the child dies, or subjecting that woman who has been repeatedly examined through a hairy vulva with ungloved and unclean hands to a cutting operation, such as section, whether it be extraperitoneal, transperitoneal, or the classical. Every one who has had that experience believes that there are cases in which pubiotomy is indicated. Again, sometimes we misjudge a funnel pelvis. Usually we feel that if the measurements of the outlet, the bisischial plus the posterior sagittal totals more than fifteen, as stated by Klein, the patient will have a sufficiently large posterior sagittal to allow the head to pass through the outlet. I have seen two cases where this was so, and yet when the head was at the outlet the head could not be delivered, and pubiotomy was required. I have seen neglected face cases where the uterus was drained for hours of its waters, where version was an impossibility, where the mother and child were saved by pubiotomy. Dr. Bill truly said that pubiotomy is never an elective operation, but

when he said it has a place in obstetrics he also said something that every one of us should recognize.

DR. JAMES E. DAVIS, DETROIT, MICHIGAN.—I want to say a word about postmortem pubiotomy, when evisceration is to be done quickly. The technic should be simple and effective. Erdheim, of Vienna, uses the edge of a knife in palpating for the line of synthesis, then the blade is driven through the union by a few successive fist blows upon the back of the knife, only a few seconds being required for the execution of the work. If this type of operation is indicated the simplicity and effectiveness of this technic is to be recommended.

DR. QUIGLEY.—I would like to ask two questions, one the average amount of space he obtains, and the other how long does it take to do the operation.

DR. LEIGHTON.—I would like Dr. Bill to mention the after-care of these cases, the time for recovery, and the lack of union, and the possibility of sepsis.

DR. BILL (closing).—In regard to the general status of pubiotomy, I think I have made myself perfectly clear that I consider it an emergency procedure, and I will agree with Dr. Leighton that if the prenatal care had been perfect, and that if the proper care had been followed during the course of labor as outlined in the paper, these indications would not arise.

In answer to Dr. Quigley, I will say that I made some experiments at one time with the bony pelvis in regard to the expansion and concluded that it was not best to try to get a separation of more than two fingers' breadth between the ends of the bones; when greater separation was caused there was considerable elevation along the anterior surface of the ilium and sacrum, that is the anterior sacroiliac ligament, and there was a possibility I think of some loosening of the sacroiliac joint. Up to that point I did not find that it occurred. I made these experiments on the pelvis by taking blocks of wood, held together by a turn buckle of which the conjugate diameter could be increased to varying degrees, and the separation of the pubic bones and elevation along the sacroiliac point determined. I have been able to insert two fingers between the ends of the bones in clinical cases.

With regard to convalescence, I have kept these patients in bed three weeks. You do not get bony union in most cases; there is, however, a firm, fibrous union. Three weeks is the average length of the convalescence.

With regard to the after-care, it is not as smooth as that of cesarean section. That is one of the disagreeable things about it, and that is one reason why we consider it an emergency operation. But I will say this: I had one patient who did not know that she had a pubiotomy performed until her husband told her two months afterward. She knew that her pelvis was bound with adhesive plaster, but did not suspect that anything like a pubiotomy had been done. After all, the convalescence was not so bad. So far as the kind of union of the pelvis is concerned, there is little difference in the functional result.

In the literature there are cases of sepsis reported. In my own experience the results have been good. There are cases of sepsis after craniotomy; there are other cases in which sepsis has developed after forceps. As I see it, a well performed pubiotomy has no direct connection with the sepsis which is present in these cases nor does it add materially to the danger of infection.

DR. HALL.—You cannot say that with reference to craniotomy?

DR. BILL.—A certain percentage of craniotomies is followed by sepsis.

CRANIOTOMY

By A. M. Mendenhall, M.D., Indianapolis, Ind.

THE subject of craniotomy is one infrequently chosen by an essayist, yet its importance as an obstetric operation seems to thoroughly justify its consideration and discussion from time to time.

There are two or three reasons why this subject is not more often brought before medical societies, among them being the fact that the operation carries with it a certain gruesomeness which is not without its effect upon the operator and his assistants and audience; no obstetrician cares to perform this operation especially and has no desire to be known as an expert in this line. Then there are certain well-known religious views which are in opposition to craniotomy under a great many conditions.

Nevertheless it is not well that any of these reasons should be allowed to place this important obstetric procedure so far in the background that it is in danger of being overlooked.

I am sure there is no one of any considerable experience in obstetrics who has not frequently known of cases where good opportunity and indications were present for craniotomy, but where the operation was seemingly entirely overlooked. Then again we are all aware of many cases where craniotomy has been done quite needlessly.

With my chief purpose in offering this subject for consideration being to emphasize first that craniotomy should be done in many cases where it is not done, and secondly should not be done in many cases where it is being done, I shall first of all discuss the indications.

In all cases where the fetus is dead and delivery is not progressing quite rapidly and easily, there is no doubt whatsoever about the propriety of craniotomy, except in that rare instance where we have to deal with a large child and a true conjugate of 5 or 6 cm. or less.

There is no excuse for the application of forceps to the head of a dead child. Neither do we feel that a version on a dead child is ever indicated. In case the child is dead and for any reason it seems desirable to aid in the delivery, it is far better for the mother, and in this instance she is our only patient, that we should first of all perforate and reduce the size of the head.

In this connection I desire to quote from DeLee[1] in his discussion of the impropriety of forceps or internal podalic version delivery of a dead child.

"The result of continued attempts (with forceps) is severe tears, hemorrhage, and puerperal sepsis. The mother may be left a life long invalid. The second operation that is too often undertaken to get around the necessity of hurting the dead child is version. . . . . The operation of craniotomy is simple, requires less skill than version, has no attendant dangers, other than those the operator can avoid, sepsis and injury to the soft parts. . . . . To do a version, or a forceps, or a cesarean section is not justifiable when the child is dead." Still quoting DeLee[2] "No accoucheur should have any compunctions about mutilating a dead child, yet I have seen the most serious operation carried out by physicians in order to avoid the necessity of perforating a piece of lifeless clay. Either they fear opprobrium, or they overrate the dangers of craniotomy. Craniotomy is chosen, the fetus being dead, whenever an indication arises for immediate termination of labor. Craniotomy is less dangerous than forceps. Sentimental reasons advanced by the family should not stand in the way of the accoucheur doing the best for the mother. When the child is dead, even if there is no indication for the immediate termination of labor, perforation of the cranium and reduction of its size may be desirable. This is true of primiparae—we wish to save the levator ani and pelvic outlet from overstretching, and, further, it is thus possible to shorten the time of labor."

The writer believes that one of the real reasons why an operator may refrain from performing craniotomy is the fear of the family's criticism and the fear that he may be blamed for the death of the child. There can be but one answer to this attitude, tell the proper members of the family that the child is dead and by a destructive operation upon it, the mother's life and health can be better safeguarded.

Very often during the course of a hard forceps delivery or an internal podalic version or breech extraction, it is wise to refrain from further attempts at delivery long enough to ascertain the condition of the child, and if it is discovered that the cord has ceased to pulsate, resort should be promptly made to the perforator. The obstetrician is frequently called to aid in the delivery of the after-coming head and naturally arrives some time after the death of the child and in cases of this kind the perforator is always the instrument of choice.

Not long since there was reported in the medical literature a case where a physician in attempting to extract an after-coming head succeeded only in extracting the body and leaving the head in the uterus. For the removal of this head a cesarean section was done and in describing the huge size of the head which was hydrocephalic, it was stated that an extra large incision in the uterus was necessary in order to remove the head. It would seem that in this case there were none of the indications for hysterotomy and most all the contraindications. Before the body was pulled away from the head or even afterwards it should have been quite easy to perforate and crush this head and remove it with far less jeopardy to the mother.

Above all else it seems that we need to more firmly establish in the minds of physicians that a dead baby or in this extreme case

only its head, is nothing more than a foreign body and should be handled merely as such; that when the baby dies we have one and only one patient and all our efforts should be concentrated toward the conservation of the life and health of that one patient.

As to craniotomy upon a living child, many questions of doubt arise. It is not difficult to find many excellent authorities who find many indications for craniotomy when the child is still living.

First of all, and probably most frequently of all these borderline cases, is that of the hydrocephalic child. In the minds of most obstetricians there is little hesitancy in recommending a perforation where the diagnosis of hydrocephalus can be made with at least a high degree of certainty.

In our present position of being unable to give more than a very serious prognosis as to life or mental and physical development of the hydrocephalic and with a thorough appreciation of the great weight upon relatives and society by the presence of the ordinary case of hydrocephalus, it would seem that craniotomy is a legitimate and merciful operation in every case where consultation of medical men points to a definite diagnosis of hydrocephalus and at least where the size of the head seriously jeopardizes the mother. Certainly no mother's life should be hazarded to the extent of a cesarean section with reasonable assurance that the child to be obtained is afflicted with hydrocephalus. Then along with hydrocephalus should be mentioned a great many of the monsters with which we may come in contact, though it is more seldom that we are able to make the antepartum or intrapartum diagnosis. If the diagnosis can be made prior to delivery and especially if confirmed by the x-ray, no attempt at cesarean section, internal podalic version, or forceps on such a case that is offering any serious degree of dystocia should be made.

No hesitancy should be felt in perforating the head of a child prior to viability in all cases where rapid delivery seems imperative. In this class should be mentioned eclampsia, placenta previa, premature separation of the placenta, toxemia, nephritis, or other constitutional disease of the mother. Often in cases of spontaneous miscarriage a rigid cervix very greatly delays the labor when perforation alone would promptly end a hard and painful and sometimes dangerous ordeal for the mother.

Lastly in considering the indications for craniotomy should be mentioned that rather a large group of cases where the child may still be living but where its ultimate survival is in great doubt regardless of how delivered and where any other operation greatly increases the risk of the mother. In this group should be mentioned those cases where uterine sepsis exists. In regard to this question I desire to quote Newell,[3] who says:

"No method of abdominal delivery is safe in cases of virulent infection of the uterus, and therefore, in these cases abdominal delivery is to be avoided, if delivery can be otherwise accomplished, craniotomy being the operation of choice in cases in which no other method of delivery through the pelvis is possible, even though the child be alive. The maternal mortality following craniotomy even on infected cases, is less than that following any other similar abdominal operation under similar circumstances, and the chances of the child, even if delivered by cesarean section, under these conditions, are rather poor, many children dying of infection a few days after birth. Therefore, the operator should not consider the interests of the child, but should perform craniotomy if the pelvis is large enough for the delivery of a mutilated child."

Williams[4] likewise states that:

"Although it must ever be the duty of the obstetrician to do his best to save the life of both mother and child, it is nevertheless conceivable that conditions may arise under which craniotomy upon the living child may not only be perfectly justifiable, but even imperatively demanded. . . . . If the mother is not seen until she has been in the second stage of labor for considerable time, and is already infected, classical or extraperitoneal cesarean section, as well as pubiotomy, is clearly contraindicated. In such cases the child should be sacrificed in the interests of the mother, as the only other safe method of delivery consists in cesarean section followed by hysterectomy, which inevitably entails complete abolition of the reproductive function. Again, if the child is in poor condition, as shown by a too rapid or too slow heart beat, or by the passage of considerable quantities of meconium with a vertex presentation, its life is already in such peril that, against that of the mother, it is no longer entitled to serious consideration. Moreover, in country districts, where the physician is unable to summon sufficient assistance, and is without the necessary appliances for an aseptic operation, cesarean section or pubiotomy should not be undertaken and craniotomy becomes the operation of choice."

It would seem that there is but one solution to the problem of religious belief. In all cases where the best obstetrics seems to be the operation of craniotomy on a living child, then the relatives or friends concerned should have all the facts carefully placed before them. After we have attempted to explain to them the *pros* and *cons*, we can only abide by their decision, but our full duty to them has not been discharged until we have requested permission to perform craniotomy. In the handling of charity cases it is usually the rule to have all applicants for treatment in the maternity hospitals sign a statement which leaves all question of treatment to the hospital and in these instances the question of further permission is not necessary. But it is always well to know that such a permit has been signed or that proper permission has been obtained before beginning the operation of craniotomy.

Before resorting to craniotomy on a living child we should bear in mind that the extraperitoneal section as practiced by Davis and McPherson seems to offer a method of delivering the potentially infected cases with a high degree of safety; and those authorities who are advocating the low cervical section after transverse incision in

the peritoneum and deflection of the bladder downward are obtaining results which bid fair to greatly reduce the indications for destruction of a living child.

As to the mortality of the operation of craniotomy, statistics vary widely. Dr. T. W. Markoe a few years ago published some records showing 12½ per cent mortality, but maintained that death was nearly always due to conditions present before beginning the operation or to the method of performing it and that such a high mortality was by no means necessary. DeLee[5] says: "There should be no mortality from craniotomy if it is properly carried out."

In a report several years ago by Voorhees[6] upon 96 craniotomies in the Sloane Maternity, there was a maternal mortality of 26.4 per cent; but the author calls attention to the fact that practically half these deaths were due to eclampsia and that many of the other cases were moribund from various causes when the operation of craniotomy was begun. No deaths could be attributed directly to the operation itself.

Among the contraindications to craniotomy might be mentioned first of all a pelvis so markedly contracted as to offer a true conjugate of less than 5 or 6 cm., as in such cases with an average sized child there will be experienced marked difficulty in effecting the delivery and it may be quite impossible of accomplishment.

A previous craniotomy should stand out very strongly as a contraindication to a second one. In other words no obstetrician is at all excusable if he allows a patient in his charge to reach the stage needing a craniotomy the second time at least for pelvic disproportion. The previous craniotomy should be a warning signal, and a timely version or cesarean section should be performed in order to avoid the necessity of further loss of life. Then possibly there are a few cases of pelvic tumors or cervical disease or scars which offer insurmountable obstacles to craniotomy.

In preparing for this operation in addition to the usual antiseptic precautions there are at least a few conditions which should be fulfilled. The cervix should be fairly well dilated or easily dilatable, though of course the size of the fetal head is to be greatly reduced and full dilatation is not of the same importance as in an ordinary forceps delivery. Yet, if the craniotomy is done as we often see it done and if some of the obsolete instruments are used that are still being used, there is grave danger of serious injury to a cervix which is not well dilated.

Catheterization as in all obstetric operations is of very great importance. One of my cases gave me a very lasting impression of this, in that catheterization relieved me of possible blame for an injury which was present before I began the craniotomy. The catheter passed into the meatus properly but entered the vagina

through a large laceration produced in attempts at forceps delivery before the patient came under my care.

Then unless the head is low down or very firmly impacted it is always well to have an assistant hold it firmly through the suprapubic region while the operator perforates, as it sometimes moves about to such a degree as to markedly increase the difficulties and dangers.

As to the instrument of choice it seems that most operators prefer the Tarnier basiotribe. It offers a triple combination of an excellent perforator, crushing apparatus and tractor all in one instrument and in my own experience is far superior to any other device. In addition to having the triple combination in one instrument the Tarnier basiotribe greatly reduces the probability of injury to maternal soft parts by splinters or edges of cranial bones and rarely ever slips off.

Once the perforator has entered the cranial cavity it should be carefully but positively introduced down to the medullary portion of the brain and moved about in such a manner as to quite completely destroy the vital areas of the brain or the very disconcerting condition may arise of having the child delivered still alive. I have seen two cases in which perforation had been done and the head markedly crushed and still the babies made efforts to breathe after delivery. Authentic cases are on record of the babies living for hours and even days and one case lived for years as an idiot.

Within the past few months a case was brought to my attention where the perforator had been introduced and the baby delivered by high forceps; the child is now alive and well at two years of age. The child only shows a small scar over the area of the anterior fontanelle and to my mind it is altogether likely that the perforator was inserted between the scalp and cranium and that the cranial cavity was not entered, yet these cases serve to illustrate what may happen and to warn us against depending on mere perforation. The fingers should always be a guide for the perforator and an attempt should be made to perforate near the pubis as this will reduce the dangers of injury to the mother. In using the Tarnier basiotribe an effort should always be made to insert the perforator deeply and to apply the blades high on the sides of the head in order that the possibility of their slipping off may be reduced to a minimum. Also it is well to screw the locking device down quite firmly as in doing so the head is being reduced in size and the dangers of the instrument slipping off are still further reduced.

SUMMARY

1. Craniotomy is an operation we should have no hesitancy in deciding upon in all cases where the child is dead and there are no insuperable obstacles to pelvic delivery of the mutilated child.

2. Craniotomy upon a living child may at times be indicated if there exists little or no hope of its ultimate survival and the mother would be seriously jeopardized by any other method of delivery.

3. The operation *per se* should carry with it no maternal mortality.

4. With the safety of cesarean section in its various forms developed to where it is today, a craniotomy performed upon a living child always represents improper care either by the operator or his predecessors on the case.

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DISCUSSION

DR. ADAM P. LEIGHTON, Portland, Maine.—I still adhere to the few remarks I have previously made relative to craniotomy. I do not wish to appear disrespectful, but there are cases, possibly, in hospital treatment, brought in to you where craniotomy may be indicated. Unfortunately, I have no general hospital clinic, and I can imagine possibly a case in the country which might be so bungled that craniotomy might be the way out. The possibility of a dead baby may offer an indication for craniotomy, but if that intrauterine death was due to my bungling or carelessness, I should dislike to finish the picture! I do not see any particular reason for allowing the woman to get into such a condition that craniotomy might be indicated.

DR. WILLIAM PFEIFFER, Brooklyn, New York.—Dr. Leighton has not a hospital service where cases are handed to him, seriously compromised but those who have such service are up against it. There can be no difference of opinion in regard to the dead child. With regard to the living child, I beg to differ with him except in the case of hydrocephalus. As an obstetrical proposition, it is not sound judgment. I think there are other methods of delivery. In a recent Johns Hopkins Bulletin, there is an article by Harris from Williams' Clinic, showing in 243 cesarean sections, 28.7 per cent hysterectomies performed with a very small mortality and delivering in most instances a live child. E. P. Davis and Williams do hysterectomies upon cases that have been examined once or twice considering them infected cases.

As to the ease of the operation, it is not so easy as the doctor sets forth. After the child's head is perforated, the cephalotribe does not always hold, and occasionally it will be necessary to apply it three or four times before a good grasp can be obtained.

In a recent case of very badly bungled perforation, an attempt at forceps had been made before the cephalotribe was applied, and version had also been attempted. The child was in transverse presentation, with a high contraction ring, and the woman almost pulseless. It was difficult to complete the perforation and to make the extraction. The woman died in twelve hours. That is nothing against the operation because it was a badly selected case. We cannot say which child will survive and which will not in operating on them by abdominal route and I hesitate to perforate the head of a living child.

DR. EDWARD SPEIDEL, LOUISVILLE, KENTUCKY.—The operation of craniotomy is performed so infrequently by most of us that unless conditions are very fair, it becomes a more dangerous operation than the three which we substitute for it—version, high forceps, or cesarean section. Consequently in anything more than a moderately contracted pelvis it becomes a serious thing to do a craniotomy. I do not know whether the essayist included transverse presentations in considering the subject or not. The majority of destructive operations that we have been compelled to perform in the City Hospital in Louisville have been in neglected transverse presentations where we have an impacted dead child, with an arm hanging out of the vagina and the waters drained away. In those cases I find it an easy thing to deliver by amputating the arm. I have never met a case that did not occur in a multipara. The arm can be pulled down to the vulva, the anterior vaginal wall protected by a retractor, and with scissors curved on the flat, the arm can be cut away from the shoulder; then it is easy to reach the leg and bring out the child. I have done this six or eight times and in no instance was there any difficulty with the aftercoming head.

DR. WILLIAM D. PORTER, CINCINNATI, OHIO.—The essayist spoke against version, stating that it is contraindicated in those cases in which craniotomy was applicable. There is one condition, however, which he mentioned in which I think craniotomy and version will enable us to handle the case better than in any other way, and that is in hydrocephalus. In these cases it is easy to perforate the head, but the flaring cranial bones are difficult to deliver satisfactorily. They are easily handled if, after perforation, you do a version, and as the head comes into the pelvis the bones come together, the brain is extruded and the delivery is a simple process.

DR. ARTHUR H. BILL, CLEVELAND, OHIO.—I dislike to go over what I have already said in regard to perforation of the head. What I said did not concern the dead child but the living child. In cases in which Dr. Mendenhall says there are contraindications to the use of cesarean section of any variety, I do not feel that we are justified in destroying the child when we have a means of delivering it through the pelvic cavity by enlarging the bony girdle. To my mind sawing through the pubic bone, which is an operation entirely outside of the genital tract, outside of the vagina, the uterus and peritoneum, does not complicate the situation in regard to infection, or materially add to the danger. I cannot see any reason for saying that pubiotomy is contraindicated in cases that have been neglected, that is the so-called potentially infected cases when the child is still alive and in good condition. I laid emphasis on pubiotomy as an emergency procedure. Perforating the head of the living child to my mind is about the worst thing we can do in obstetric practice.

DR. MENDENHALL (closing.)—In reply to the remarks of Dr. Leighton, I would refer him to the fourth conclusion in my summary. You have no predecessors on your cases, you acknowledge. Those obstetricians who are doing clinical or charity work get cases under altogether different conditions from what you get your cases. I hope it will not be necessary to do craniotomy upon my private cases. I have yet to do a craniotomy on my own case. That is a different question from the cases that are sent in to us.

Some one mentioned transverse presentation. I did not say anything about that phase of the subject as it does not enter into the question. If it did, we would talk about brow, face, and so on. Any presentation can be taken care of by some other method, by Braxton-Hicks version, internal podalic version, or by cesarean section. There must be more indications than transverse presentation to warrant embryotomy or a mutilating operation.

Dr. Porter spoke of version. We find that even though the baby is dead, some practitioners resort to version to deliver that dead baby. That was the only thing I brought out in my paper regarding version, which to my mind is contraindicated. Ordinarily this dead baby represents a labor that has existed for some period of time, and after it is discovered it is dead, I believe no one is justified in doing either a cesarean section or a version. Nevertheless, there are a great many operators who do version on a dead baby with a prolapsed cord for example. That is absolutely contraindicated. That is the only thing I brought out in connection with version.

A CLINICAL STUDY OF THE PUERPERIUM*

By M. Pierce Rucker, M. D., Richmond, Va.

LITERALLY, the puerperium is the period of confinement at childbirth. This, however, is not the usual acceptance of the term. DeLee[1] states that it begins at the completion of the third stage of labor and ends when the reproductive organs regain their nonpregnant condition. On the same page he says that this "*restitutio ad integrum*" never occurs. When I was in general practice I consider the puerperium to last from ten days to two weeks, and I believe such is a common opinion. Somewhere between these extremes, ten days and infinity, lies the true duration of the puerperium. For the purposes of this study, I have considered the puerperium to end either when normal menstruation was re-established or when the patient was again pregnant.

In this period of varying length the woman is endowed with no especial immunity. She may have any of the surgical conditions common to her sex, appendicitis,[2] cholescystitis,[3] ovarian cyst with twisted pedicle, ileus,[4] etc. As a matter of fact her condition may be a predisposing cause for the lighting up of any of these conditions, and it certainly complicates their diagnosis and treatment. The same may be said for certain intercurrent diseases, notably tuberculosis, malarial fever,[5] meningitis,[6] and in some localities, beriberi and malta fever. It is a common experience in the South for labor to light up a latent malaria. In this category probably should be put the puerperal psychoses.[9] A third group are those conditions that may be directly attributed to parturition, such as grave anemia,[7] simulating pernicious anemia, pyelitis,[8] gangrene of the extremities,[10] arthritis and endocarditis,[11] thrombosis,[12] embolism, and possibly tetany.[13]

With these fortunately rare complications I am not particularly interested at this time, but wish to direct your attention to the ordinary symptoms and physical findings of the puerperium. For this purpose I have reviewed notes of 270 private patients and 30 dispensary patients who have been examined between the fourth and sixth week postpartum. A number of these patients were followed further until either they began to menstruate regularly or else became pregnant again, but unless they developed some symptoms not noted at the regular examination the subsequent history was disregarded. Each patient was put through as careful a history taking and physical examination as if she had been a new patient. One hundred and sixty-seven were primiparæ and 133 were multiparæ of varying degrees from ii- to xi-para. Twenty-four

*Presented by Title.

were negroes. Some of the clinic patients were delivered by midwives, and some by fourth year medical students. One private patient who had phlebitis and polyarthritis, and one who had had eclampsia, were seen for the first time several weeks after delivery. One case of tubal abortion and laparotomy is included because of the interesting condition found at postpartum examination. Her only other pregnancy ended in a spontaneous abortion at four months, yet this patient showed a bilateral tear of the cervix and a slight cystocele. There were four patients whose blood gave a four-plus Wassermann reaction and three who had a two-plus reaction. One patient with a four-plus Wassermann had no signs or symptoms save a soft systolic murmur at apex, another had increased perspiration, cough, poor appetite and a tender abdomen, a third had a fair appetite and pain and tenderness in the abdomen, and the fourth had a fair appetite and enlarged tonsils. Of the three two-plus Wassermann cases, one had headache and enlarged tonsils, and two had a poor appetite, and tenderness in the abdomen and pelvis. One had in addition a mass in the broad ligament. When it is considered that four out of five patients had good appetites, it is significant that five out of the seven Wassermann reacting patients should have had impaired appetites.

Headache was complained of at some time in the puerperium in 95 istances or 32 per cent. Epistaxis was noted in two per cent and sores in the mouth in three per cent of the cases. Forty patients complained of sore throat, sixty of alopecia, forty-three of rheumatic pains, and forty-two had a cough. Four of these were tuberculous and four had a transient bronchitis. Ninety-one had increased perspiration and fifty-two had diminished perspiration. Shortness of breath was a symptom thirty-two times, night sweats sixty times, and pains about the heart nineteen times.

The question as to whether the patient has gained or lost weight necessitates having a standard for each patient. It would be desirable to compare the weight a month after delivery with the weight of the patient just before pregnancy began. This latter weight is rarely available, and as a substitute I have used the weight of the patient at the time of her marriage. Nearly every woman remembers this with a considerable degree of accuracy. One hundred and thirteen patients gained 1854½ pounds or an average of 16.41. Thirty-five lost a total of 406 pounds or an average of 11.6. In some cases this change in weight covers many pregnancies and a long period of years. You can get at the change per pregnancy more accurately by considering only primiparæ. Fifty-seven primiparæ gained upon an average 17.22 pounds above their premarriage weight. On the other hand nineteen primiparæ lost upon an average 8.85 pounds. In two primiparæ the postpartum

weight was the same as their premarriage weight. By combining these three groups we get an average gain for the primiparæ of 10.43 pounds.

Thirty-five patients had either a fair appetite or a variable one, and twenty-two had a poor appetite. These two groups of fifty-seven cases I have combined under the head of impaired appetite. Nausea was complained of twenty-four times, and belching of gas twenty-eight times. Seventy-one patients were constipated. Six patients complained of hemorrhoids and two had rectal fissures which healed promptly under treatment. As the progress of labor was followed by rectal examinations in the large majority of the 300 cases, this affords some idea of the frequency of this painful complication of rectal examinations. Nocturnal micturition was a symptom in seventy-two cases. Fifty-two had to rise on an average of once at night, sixteen twice, and six three or more times. Twenty patients, including two who were known to have acquired gonorrhea shortly after returning home from the hospital, had painful micturition. Thirteen patients had edema in the form of swelling of the feet. Backache was complained of forty-five times.

In studying the character and duration of the vaginal discharge in the puerperium, it is hard to find a satisfactory standard of measurement. What one woman would consider a moderate flow, another would consider a very free discharge. I have taken as a rough measure the menstrual flow for each individual. The number of days that the patient had a flow as much as her usual menstrual flow, was noted, and the result was classified by weeks. In the first week there were 100 cases, in the second week eighty-two, in the third thirty-one, in the fourth eleven, and in the fifth, two cases. A flow as much as a menstrual flow that lasted more than two weeks was considered a prolonged flow and forty-four patients came in this class.

The tonsils were considered diseased in fifty-seven instances. Twenty-one patients had a systolic murmur at the apex and two had a murmur at the base. These were all taken to be functional. One patient had a presystolic thrill, and two had an irregular rhythm. The question of the tone of the abdominal muscles deserves more attention than had been accorded to it. It is conceivable that the loss of tone so often seen in women who have borne children might be due to a systemic condition, especially chronic infection, or the strain to which they are subjected during pregnancy and labor. The condition of the abdominal muscles was especially noted in 160 cases. The tone was found to be good in ninety-nine and fair and poor in sixty-one. The effect of the method of delivery upon the tone of the abdominal muscles is shown in Table I.

The following findings were noted upon abdominal examination; enlarged liver 18 times, palpable spleen 6, palpable colon 31, abdominal tenderness 31, tenderness over the gall bladder 3, and hernia 1. The perineum showed an obtunding of the mucocutaneous angle 49 times,

TABLE I

SHOWING EFFECT OF METHOD OF DELIVERY UPON TONE OF ABDOMINAL WALL

METHOD OF DELIVERY	GOOD TONE	POOR TONE
	(a) primiparæ	
Bag and Version	34	7
Version	16	3
Bag and Forceps	1	0
Forceps	3	5
Bag and Spontaneous	2	1
Spontaneous	7	5
Abortion	1	0
	(b) multiparæ	
Bag and Version	20	12
Version	7	6
Forceps	1	5
Bag and Forceps	1	0
Bag and Spontaneous	1	1
Spontaneous	5	16

and a tear back into the muscle 14 times. Thirty-nine of the 49, and all of the 14 were multiparæ. Of the ten primiparæ who showed a mucocutaneous tear, five were delivered by version, four by forceps, and one spontaneously. The 167 primiparæ of this series were delivered as follows; version 114, forceps 25, spontaneous 23, not rotated 4, abdominal section 1. A cystocele was found in 15 multiparæ and in 3 primiparæ. One of the primiparæ was delivered with forceps, one by bag and version, and one by cesarean section. The two latter were accompanied by pelvic inflammation, which was possibly an etiologic factor. Four rectoceles were found, all in multiparæ. The fundus was in an anterior position 207 times, and in a posterior position 86 times, 29.4 per cent. There was subinvolution in 7 instances. Lynch found retrodisplacement in 42 per cent of 1200 cases examined late in the puerperium. Approximately 25 per cent of them gave symptoms. Stacy found a retroposition in 20 per cent of 1000 nulliparous women who had no history of pelvic inflammation or tumors. As I have no fixed rule for allowing my patients to get up, unless there is a second degree laceration, there is quite a variation in the time they remained in bed. Some were out of bed on the second day and some stayed in bed ten or eleven days. This information was recorded in 199 cases. Ninety-five were out of bed in the first six days, and there was retroposition in 21 per cent of them. One hundred and four did not begin to sit up until after the sixth day, and 43.2 per cent of them had retrodisplacement.

The condition of the cervix according to the method of delivery is shown in Table II. The uterus was fixed 17 times. Eleven patients were tender on one side or the other of the uterus, and in three I was able to make out a mass.

The breast complications were as follows: one abscess, three patients with caked breasts and no elevation of temperature, and nine with tender breasts and fever. Of these thirteen cases, 54 per cent

TABLE II

SHOWING THE METHOD OF DELIVERY AND THE CONDITION OF THE CERVIX

METHOD OF DELIVERY	CONDITION OF THE CERVIX				
	NO TEAR	STELLATE TEAR	LATERAL TEAR	BI-LATERAL TEAR	NOT STATED
			(a) primiparæ		
Bag and Version	31	12	11	17	1
Version	17	11	4	9	1
Bag and Forceps	1	1	2		
Forceps	7	7	3	3	2
Bag and Spontaneous	2				
Spontaneous	10	3	1	10	
Cesarean section				1	
			(b) multiparæ		
Bag and Version	13	14	6	17	4
Version	2	7	2	9	1
Bag and Forceps		1			
Forceps	2	2	1	3	1
Bag and Spontaneous	1	1		3	
Spontaneous	8	12	5	15	4

had headache, 8 per cent epistaxis, 30 per cent sore throat, 54 per cent increased sweating, 38 per cent a cough, 30 per cent shortness of breath, 30 per cent night sweats, 30 per cent a loss of weight, 46 per cent impaired appetite, 46 per cent poor abdominal tone, 8 per cent abscess of the labia, and 23 per cent a leucorrhea.

The grouping of the commoner symptoms can be readily seen in Table III, which shows the percentage of the whole group for any given symptom, (the underscored figures) as well as the percentages of the patients with that particular symptom who have the other symptoms. Take for example rheumatic pains. Fourteen per cent of the entire series had rheumatic pains as is shown by the underscored figure in either the vertical or horizontal column. Reading horizontally, we see that of this 14 per cent, 50 per cent had headache, whereas only 32 per cent of the entire series had headache, 28 per cent had sore throat, against 13 per cent of the whole series, 28 per cent had alopecia, against 20 per cent of the entire series, etc. Thus it is easily seen that the significant symptoms associated with rheumatic pains are headache in 50 per cent, sore throat 28 per cent, alopecia 28 per cent, increased perspiration 40 per cent, impaired appetite 40 per cent, constipation 37 per cent, backache 30 per cent, diseased tonsils 26 per cent, loss of abdominal tone 30 per cent, and leucorrhea 33 per cent. If however you pick out the significant symptoms associated with night sweats, you have alopecia, increased perspiration, cough, shortness of breath, loss of weight, nocturnal micturition, prolonged flow, loss of tone of the abdominal muscles, and lacerated perineum. Except for the laceration of perineum, this grouping is rather suggestive of some respiratory tract infection. The significant symptoms with retroposition of the uterus are; increased perspiration, cough,

TABLE III

SHOWING RELATIONSHIP OF SYMPTOMS TO ONE ANOTHER IN PERCENTAGES

	Headache	Sore Throat	Alopecia	Rheumatic Pains	Inc. Perspir.	Dec. Perspir.	Cough	Short of Breath	Night Sweats	Loss of Weight	Imp. Appetite	Constipation	Noct. Micturit.	Backache	Prolonged Flow	Dis. Tonsils	Loss Abd. Tone	Lac. Perineum	Retrodisplacement	Leucorrhea
Headache	**32**	22	33	22	32	16	29	19	19	16	22	29	32	24	12	25	24	23	31	15
Sore Throat	53	**13**	35	30	38	23	23	18	23	18	33	35	33	23	15	48	33	48	20	35
Alopecia	52	23	**20**	20	37	22	18	25	25	17	25	25	37	15	17	18	15	22	23	27
Rheumatic Pains	50	28	28	**14**	40	19	16	9	12	14	40	37	26	30	14	26	30	19	23	33
Increased Perspir.	33	16	24	19	**30**		23	14	41	17	23	27	30	16	16	23	26	23	35	20
Decreased Perspir.	29	17	25	15		**17**	15	2	8	11	21	31	23	15	13	19	21	17	33	21
Cough	64	21	26	17	50	19	**14**	21	29	21	26	31	31	21	29	26	26	26	40	29
Short of Breath	56	22	47	13	41	3	28	**11**	28	19	25	16	28	22	13	13	13	22	16	22
Night Sweats	30	15	25	8	62	7	20	15	**20**	18	22	28	32	13	18	18	30	32	33	20
Loss of Weight	43	20	29	17	46	17	26	17	31	**12**	34	23	37	20	26	14	40	14	23	26
Impaired Appetite	37	23	26	30	37	19	19	14	23	21	**19**	28	26	19	18	16	26	23	30	16
Constipation	39	19	21	22	35	22	18	7	24	11	22	**24**	35	17	13	21	31	31	25	18
Nocturnal Micturit.	41	18	31	15	38	16	18	12	26	18	21	35	**24**	21	11	15	33	31	31	15
Backache	51	20	20	29	33	18	20	16	18	16	27	27	33	**15**	9	27	27	33	40	22
Prolonged Flow	25	14	23	14	34	16	27	9	25	20	23	20	18	9	**15**	23	23	25	27	14
Diseased Tonsils	42	33	19	19	37	18	19	7	19	9	16	26	19	19	18	**19**	25	29	29	21
Loss Abd. Tone	38	21	15	21	39	19	19	6	29	23	24	36	39	18	16	23	**20**	31	34	21
Lacerated Perineum	35	24	21	13	33	14	17	11	30	8	21	37	35	24	17	25	30	**21**	27	25
Retrodisplacement	33	9	14	11	37	20	20	6	23	9	20	21	27	22	13	19	24	20	**29**	14
Leucorrhea	25	25	29	25	33	20	22	12	22	16	16	24	20	18	11	22	24	29	25	**18**

The figures in black type are the frequency percentage of the symptoms in the whole series.

backache, and loss of abdominal tone. Here we have added an additional factor, i. e., a mechanical one.

Talbot[14] has called attention to the importance of chronic infection in pregnancy; LaVake[15] believes that focal infection plays an important part in the etiology of eclampsia. Very recently Rawley[16] has seemingly been getting good results in the treatment of early toxemias of pregnancy by the eradication of apical abscesses. The grouping of characteristic symptoms in those patients who are only fairly well would suggest that possibly focal infection plays a not unimportant rôle in the puerperium. Unfortunately none of these patients were examined for apical abscesses, but a considerable number of them had diseased tonsils and about the same number had a cervicitis.

In conclusion, it would seem that our patients need more careful supervision during the puerperium, and that we should bear in mind not only the mechanical faults incident to childbirth, but also the possibility of some focus of infection.

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THE SURGICAL TREATMENT OF CERTAIN PUERPERAL INFECTIONS

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AT THE meeting of the American Association of Obstetricians and Gynecologists in 1914, I read a brief paper on the treatment of puerperal thrombophlebitis. (*American Journal of Obstetrics and Diseases of Children,* Volume lxxi, No. 2, 1915.) My opening paragraphs read as follows:

"While the average mortality of puerperal pyemia is ordinarily regarded as between 67 and 75 per cent, it is probable that the mortality of pyemia due to infected thrombophlebitis, in which the veins of the broad ligaments, the internal iliac, or the ovarian are involved, is 100 per cent; at least I have not been able to find any cases of recovery without operation on record in which such a lesion was demonstrated by subsequent operation or history.

"The classical symptoms of infected thrombophlebitis are repeated chills, with corresponding wide fluctuations of temperature, with direct evidence to the touch of involvement of the veins of the broad ligaments on one or both sides. It is possible, as in the case reported by Jellett, that there may be no evidence of involvement of the broad ligament, but such a condition is a rare exception.

"Treatment of these conditions by vaccines and serums is quite uniformly conceded to be futile, and expectant treatment, if the diagnosis is correct, means a mortality of 100 per cent."

In that paper I quoted from (1) J. Whitridge Williams, of Baltimore who, in a paper published in 1909, reported five cases in which he had operated, these five being embraced in a study of 56 cases from the literature; (2) Hiram N. Vineberg, who had reported one case; and (3) Jellett, then Master of the Rotunda Hospital of Dublin, whose paper, published in August, 1913, presented quite an exhaustive discussion with earnest recommendation for operative treatment. He reported five cases. In my paper I reported four cases.

The treatment recommended by the surgeons from whom I quoted consisted in ligation of the infected vein or veins beyond the thrombus so as to prevent the escape of the infected material into the general circulation. In Vineberg's case he had in addition removed the uterus.

In my own cases I had done a hysterectomy because in my judgment that operation would usually reveal the presence of much more

pathology than appeared in the infected veins and on the average would give a larger percentage of recoveries.

That these cases were absolutely surgical in character I felt was well established by the writings alluded to. Within a few years, however, certain writers, most of whom, perhaps, are obstetricians rather than surgeons, have challenged this conclusion, and this has led me to make a review of the entire subject.

These writers, some of them at least, have apparently failed to carefully individualize their cases of puerperal infection. They seem to put them all in one group and thus do not differentiate between the cases that tend to get well of themselves and those which without intervention are doomed to a fatal issue.

Puerperal infection always follows some form of trauma by which an open surface is produced. A lacerated perineum or vagina, a lacerated cervix, or the raw surface left by the detachment of the placenta, is the avenue of infection. These infections may be divided clinically into five classes:

(1) The infection is limited to the endometrium, and among the older writers was known as sapremia. The early constitutional symptoms are quite similar to those of the more serious types of infection, as shown by chills, fever, sweating, etc., but they are usually accompanied by a disturbance of the lochia, with a bad odor. Ordinarily a piece of retained membrane or placenta is responsible, and with the expulsion or removal of that substance the symptoms promptly subside. Most writers leave these cases to Nature, though if the symptoms persist unduly the introduction of a wire loop, or better still the finger, with removal of the offending body, hastens the subsidence of the symptoms. "The establishment of proper uterine drainage, inducing retraction and contraction of the uterus, promptly controls this type of lesion and the fever subsides."[1]

(2) The infection passes beyond the uterine cavity into the broad ligament where an abscess forms in the connective tissue, which in due time can be easily opened through the vagina with drainage and prompt recovery. Even without intervention such abscesses will usually discharge in due time, but the delay is unnecessary and not devoid of danger. In this type of infection the bacterial invasion may possibly invade the lymphatics and thus extend into the surrounding connective tissue, reaching the peritoneum through the veins, and may result in the infection of class (5). The cellulitis in these cases frequently terminates in resolution. In that case the symptoms become less active, the mass is found hard and less sensitive, and in the end absorption takes place with complete recovery. The continuance of symptoms, increasing tenderness, and enlargement of the mass, indicate the presence of pus which should be evacuated.

(3) The infection goes to the pelvic peritoneum, by the lymphatics or through the tubes, and a pelvic peritonitis results with a collection of pus in the culdesac. In these cases adhesions usually form above the seat of infection, and the abscess can be readily opened by a free incision at the vault of the vagina, or without operation will perforate itself and discharge into the bowel, bladder, or vagina. These abscesses may assume huge proportions but the patient recovers promptly when drainage has been accomplished.

(4) The infection involves the subperitoneal connective tissue, and forms what some of the older writers described as "dry peritonitis." It resembles very closely phlegmonous erysipelas. The pus appears as a sheet lying under the entire pelvic peritoneum, and extending indefinitely upward. Drainage is impossible, and death always results promptly.

(5) This is the class of cases considered in this discussion. It embraces the infections of the pelvic veins and other infections not included in the other classes. Through the placental site usually, though the infection may enter at any other point, a phlebitis develops of the veins of the broad ligaments, and extends possibly into all of the pelvic veins, but is most serious when it involves the ovarian veins since these veins discharge on the right side directly into the vena cava, and on the left into the vena cava through the renal vein. If the involvement does not result in a purulent breaking down of the blood clot, resolution takes place, with prompt amelioration of symptoms and recovery, as is seen so generally in that form of phlebitis so well known under the old name of milk leg, or phlegmasia alba dolens. If infection takes place, however, then, as so graphically described by Murphy, the disease progresses from bad to worse, and a fatal result, unless there is intervention, is inevitable.

In this type of infection the initial symptoms are identical with those of the less serious types, but they do not subside. As a rule there will be repeated chills, wide excursions of temperature, much sweating, great prostration, rapidly developing anemia, and if the clot breaks loose and goes to the heart the usual symptoms of infected embolism.

Vaginal examination shows a failure in normal involution of the uterus, with marked tenderness on one or both sides or behind the cervix. Sooner or later a mass can be felt at one of these points. This may be well marked, or may be felt like a cord passing across. (I have never felt the "worm-like mass" mentioned by Williams, but that such a mass might be felt in certain cases is beyond question.) This mass must be differentiated from mere cellulitis in the broad ligament by the constitutional symptoms and the condition of the patient, but such a study of the patient, and careful digital study of

the pelvis, should enable a diagnosis to be promptly reached. While, as shown in the histories, careful examination will almost invariably give evidence of infected veins, it is possible that such veins might be out of reach and the diagnosis could then be made only from the history of the patient and constitutional symptoms. Although Polak[2] states that in these cases there is little or no leucocytosis, such has not been my experience as shown by cases reported in this paper.

The prognosis is practically hopeless, except as to a possibility of a very limited extent of infection. These cases are usually chronic in type, but occasionally a fulminant case appears in which a fatality is absolutely inevitable. As in tuberculous meningitis, if the patient does not die it is much more reasonable to assume that a mistake has been made in diagnosis than that recovery has occurred.

C. Jeff Miller,[3] of New Orleans, gives an exhaustive report on cases of puerperal pyemia. He gives a summary of 188 cases in which the operations were limited to the veins: 108 died, a death rate of 57 per cent. Excluding 15 cases operated upon *per vaginam*, we have 173 cases with 95 deaths, a majority of 55 per cent. As he reports several cases in which the end result was not stated, and in which we may doubtless assume that death occurred, the real operative death rate could not be much less than 60 per cent.

Ligation of the ovarian vein below its entrance into the vena cava or renal vein, requires necessarily a dangerous amount of manipulation of the vein with the grave danger of loosening the clot during manipulations and forcing it at once into the circulation. If this accident does not occur, the infected thrombus is left behind with all the risks that its presence implies, and a study of the pathology, as demonstrated in my own cases, shows that it is very seldom that the infection is limited to this one vein, or to the adjacent veins, but that it involves very extensively the pelvic veins in general, and very frequently the sinuses and veins in the wall of the uterus.

As the cases reported by Miller were treated by ligation of the infected ovarian veins, it is reasonable to assume that the more extensive infections present in most of my cases were not present in the cases collated by him and that if the more radical operation had been performed in his cases the mortality would have been much less.

During the time embraced by the operations detailed in this report, many other cases of puerperal sepsis were seen in which careful removal of the placental debris was required, and others in which it became necessary to open the vault of the vagina, or drain abscesses in the broad ligaments through the vagina or above the pubes.

As I had quoted in my original paper from the papers of Drs. Williams and Vineberg and of the Master of the Rotunda Hospital at

Dublin, I wrote to these three asking as to their present attitude toward these operations, and here quote from their replies:

Dr. J. Whitridge Williams, Professor of Obstetrics at the Johns Hopkins (February 23, 1922), writes in regard to puerperal thrombophlebitis: "I have had no experience with the method since my contribution in 1909. At that time I was very much impressed with the benefits derived from the operation, and should have used it in other cases had opportunity arisen."

Dr. Hiram N. Vineberg, under date of March 18, 1922, writes in regard to the operative treatment of septic thrombophlebitis: "I am still convinced of its value in properly selected cases, and when it is not too long deferred. When to intervene, and when not to intervene, is frequently a very delicate point to decide, hence the difficulty of laying down definite indications. For the past couple of years I have had no occasion to operate, but within the last few months I have had a very unusual, and in my experience unique, case of septic thrombophlebitis complicating a large fibroid tumor. At the operation the left infundibulopelvic ligament seemed slightly infiltrated, but it did not occur to me that the vein was the seat of septic thrombosis, as was disclosed at the autopsy. The chills and fever existing prior to the hysterectomy persisted afterwards, and continued until her death twenty-five days later. In view of these facts I soon arrived at the conclusion after the operation that I had to deal with a septic condition probably of the left vein, and desired to re-open the abdomen; but I could not get any consultant to concur with me, and in consequence had to abandon the idea. The autopsy revealed the left ovarian vein the size of one's thumb, filled with a purulent thrombus and lying in a bed of pus. Its removal would have been easy and in all likelihood the patient would have recovered."

In a letter from Gibbon Fitz Gibbon, Master of the Rotunda Hospital, Dublin, under date of March 14, 1922, after speaking of Dr. Jellett's report, he says: "Since I took charge here I have not met a case which suggested septic venous thrombosis. The acute septic cases which I have had to deal with have either recovered, or the ones that died were of general infection without any effort at localization. If a case does localize in the pelvic veins I have no doubt the removal of the focus would be beneficial and probably the only hopeful treatment. * * * I have opened a couple of cases but they have turned out to be local collections in the appendages with the pelvic veins free. Still they were cases in which recovery was greatly helped, or even resulted, from removal of the focus. This seems only rational, but the localization in the veins in severe cases I think is rather the exception than the rule."

In addition to the above expressions I have received numerous oth-

ers from obstetricians and surgeons who read the original paper, or who are familiar with the points at issue.

Dr. George Clark Mosher, Kansas City, Professor of Obstetrics, University of Kansas (March 17, 1922), writes: "I am convinced that your method of treatment of thrombophlebitis is correct. I believe the only technic offering any hope to these patients is embodied in your paper."

Dr. H. Wellington Yates, of Detroit (March 16, 1922), writes: "I never had but three cases of thrombophlebitis that were recognized as such. These three were all operated, all three having a hysterectomy with removal of the thrombus after tying. Two of the three had septic processes within the uterine wall, and in all the thrombi were infected and broken down. One case died within a few days, one made a prompt recovery without incident, and one had a slow recovery with a stormy time."

Dr. A. J. Ochsner, Chicago (February 28, 1922), describes some cases in which he resorted to constitutional and local treatment, and which recovered. His observation in regard to the cases is: "Their recovery made me think that probably my diagnosis had been wrong." He has seen but one case in which he thought operation indicated, but that patient was moribund, and no operation advised.

Dr. C. L. Bonifield, Cincinnati (March 9, 1922), writes he has never seen a case of the type in question but adds: "I think that the treatment which you institute is rational, and the results certainly commend it."

Dr. W. P. Manton, Detroit (March 12, 1922), writes that he has never had one of the advanced cases, but has opened from below in several early cases, his patients making good recoveries. He suggests the advisability of very early operating in these cases, so as to forestall the more serious condition, and adds: "Where the uterus is filled with small multiple abscesses the question of hysterectomy is answered."

Magnus A. Tate, of Cincinnati (March 10, 1922), writes: "If a case be at all operable I believe surgical interference is justifiable, and by this I mean ligating the vessel above the thrombus and not opening the vein, the uterus to be removed according to whether the indications point toward the invasion of the muscular wall."

Dr. Asa B. Davis, New York Lying-In Hospital (March 16, 1922), writes that last year they had in the hospital 5095 confinements, with 46 deaths. They have tried pretty much everything in the way of treatment in these cases except operation. At present the treatment consists in "sending such patients to the roof and forgetting them." He adds: "They usually run a rapidly fatal course, or a long drawn out one, and many of them recover."

A careful examination of these cases would almost certainly enable one to determine in which class each should be placed, and to institute appropriate treatment.

If all cases of puerperal infection, without any discrimination as to their character, are treated expectantly, an enormously large proportion will undoubtedly recover. Thus Cragin[4] in twenty thousand obstetrical cases found 2155 cases of infection. Of this number 1902 were cases of sapremia, all of which recovered from the infection. Among the 253 cases of bacteriemia there were 54 deaths, but he does not give details as to the immediate cause of death in these cases.

The late John B. Murphy,[5] of Chicago, in quite a full description of pelvic infections, mentions a case which he saw eleven days postpartum. The professor of obstetrics and gynecology with whom he saw the case in consultation was not anxious as to the outcome, but Dr. Murphy, with his broader knowledge of pathology, gave a fatal prognosis though the obstetrician thought her "fully out of the dangers of her confinement." A little later the patient developed infarcts and emboli, and Dr. Murphy adds: "That primary clot had passed through her veins from a phlebitis. It was septic. * * * That is the type of infection where the vein is involved." Again, "when the infection is carried into the broad ligament, with its many large veins present during gestation, a phlebitis or paraphlebitis may occur,—a septic phlebitis, I mean,—forming a thrombus and even emboli, and these septic emboli may be carried through the patient's system. You may have the venous type. Here you have a thrombophlebitis." * * * "Let us come to the next type of infection which occurs on the uterine surface. The most common position in the uterine cavity for serious infections to take place is on the placental base. When it does take place on the placental base, what has been separating the blood of the mother from the placenta? That thin layer of membrane. In the case of a virulent infection the microorganisms penetrate the membrane and you have infection in the vein, followed by thrombophlebitis, septic emboli, septic infarcts, endocarditis, and death."

Dr. E. P. Davis,[6] Professor of Obstetrics at Jefferson, recommends operative treatment in suitable cases. "With abdominal incision an accurate diagnosis can be made, foci of infection intelligently dealt with, and free drainage secured. Some most unpromising cases will recover with this treatment."

Henry Jellett,[7] late Master of the Rotunda Hospital, Dublin, who has had a large experience in the treatment of these pelvic infections, in speaking of these operations, says: "In cases of well-established pyemia in which thrombosis is present, they offer what is probably the only chance of saving the life of the patient, and in quite a number

of cases they are successful." If the ovarian veins alone are infected he advises their removal, if the uterine veins alone, ligation or extirpation. If both are involved, panhysterectomy, and hysterectomy if there is no obvious thrombosis found.

Charles Jewett[8] recommends hysterectomy in cases of abscess in the uterine wall, and exceptionally in putrid endometritis. He has had some "most satisfactory" results in some of these cases from ligation of veins in thrombophlebitis.

In *Surgery, Gynecology and Obstetrics*, April, 1922, page 327, is an abstract of an article by T. Roos,[9] on the treatment of puerperal sepsis. The author discusses the treatment of puerperal sepsis, with special reference to the work done in the last few years at the Hess Midwife Institute in Mainz. In view of the severity of the infection he thinks that no remedy should be left untried which offers any promise of success whatever. He decries any sort of local treatment. He thinks that removal of the infected organs through the abdomen or vagina will usually fail because of the entrance into the operative wounds of virulent bacteria. This he thinks can rarely be prevented. He favors (1) opening of abscesses in pelvic connective tissue; (2) incision, irrigation and drainage in diffuse purulent peritonitis; (3) ligation of veins in thrombophlebitis.

As none of my sixty-seven cases developed operative peritonitis, owing I think to the more or less complete preoperative sterilization by iodin of the vagina and endometrium and particularly to the closing off of the pelvis from the abdominal cavity by swinging around the sigmoid, I cannot but feel that Dr. Roos' objection to hysterectomy is ill-founded, though other writers express the same fear.

In the abstract department[10] of *Surgery, Gynecology and Obstetrics* of May, 1922, p. 363, is an interesting review of the prognosis and treatment of puerperal infection, by Marcel Arnaudon, of Paris, who refers particularly to the studies of Couinaud, Potvin, Cotte, Cadenat and others. It is evident from this paper that these infections following abortion are regarded as more serious than those at full term, because of the frequency of criminal intervention. Treatment by serums and vaccines seems to have been of little or no avail, certainly not in the virulent types. Potvin, Cotte and Cadenat are particularly referred to as advising hysterectomy, but all agree as to the importance of making a diagnosis early in these cases, at which time a hysterectomy would give the most favorable results. Cadenat agrees with Faure in advising intervention after twenty-four hours, if the uterus is found empty and there is no amelioration of symptoms, but the rapid pulse continues with fever and chills.

De Lee,[11] in speaking of pus cavities from parametritis says that unless they are freely evacuated the patient may pass into a condition

called by the older writers "hectic" and may die of exhaustion, having wasted to a skeleton. "Rapid disappearance of the symptoms follows on proper drainage of the abscesses." He regards ligation of the pelvic veins as an operation on probation.

He specially recommends[12] hysterectomy with free vaginal drainage when the uterus is riddled with abscesses. As to that operation, he says (p. 906): "If we could tell when the infection is likely to pass the line of safety, we would know when to remove the uterus, and experience has shown that uteri are usually removed too late to do any good." He has never had any personal experience with the operation.

One of the leading opponents of the surgical treatment of puerperal infection is Prof. John G. Clark,[13] of Philadelphia, who distinctly advises the discarding of all such treatment in these cases. He does not say that he "puts these cases on the roof and forgets them," but he makes no classification of them and states that as "all roads lead to Rome," classification is unnecessary as there is no surgical treatment.

(Since Prof. Clark is from Philadelphia it might be well to bear in mind, incidentally, that when Oliver Wendell Holmes published his famous essay demonstrating the contagiousness of puerperal fever, he was most virulently attacked by Drs. Meigs and Hodge, of Philadelphia, who were professors of obstetrics respectively at Jefferson and the University, and that these same professors fought Sir James Y. Simpson in his advocacy of anesthesia in labor, saying "Pain in labor is a God given experience," and "To interfere with labor pains is flying in the face of Providence." We should also remember that Prof. Samuel D. Gross made vigorous opposition to Lister's advocacy of antiseptics, and that Prof. J. William White strongly opposed anything like routine surgical interference in appendicitis cases.)

In his book on Obstetrics, De Lee states that puerperal infection kills one in four hundred women delivered of full term children, and leaves as incurable invalids at least ten times this number.

Barton Cooke Hirst,[14] with a very large experience in puerperal infections, is a staunch advocate of surgery in cases requiring it. He says that the surgeon who operates must hold himself "in readiness to perform any of the pelvic or abdominal operations that may be found necessary when the abdominal cavity is exposed to view and to touch." Operative intervention is "demanded most frequently for localized suppurative peritonitis; * * * for suppurative salpingitis and ovaritis; for suppurative metritis, especially at the cornu * * *; for abscesses in the pelvic connective tissue; for infected abdominal or pelvic tumors."

Operation, he says, is not indicated simply because of symptoms, but because there is "some demonstrable evidence of intrapelvic or

abdominal inflammation, necrosis or suppuration. * * * If pus forms it must be reached and evacuated irrespective of its situation. * * * In favorable cases distinct signs of improvement manifest themselves in a few days, and the course of the disease is comparatively short. The mere protraction of septic symptoms is itself suspicious, *along with local signs of inflammation.*"[15]

* * * "It is a safe rule not to open the abdomen of a puerpera for sepsis unless there are physical signs of inflammation in the abdomen or the pelvis."[16]

Dr. Hirst advises that when infected pelvic tissues have to be incised "the cut edges of the broad ligaments should be allowed to gape; and the whole pelvic cavity should be filled with gauze" and drained by a glass tube at the lower angle of the incision. My technic differs from his only in covering the gauze with the sigmoid to protect the abdominal cavity, and in draining through the vagina. In speaking of infected and infiltrated broad ligaments, or foci of suppuration and infection in the uterine body, Dr. Hirst says. "The only hope for the patient in such cases lies in the entire removal of all infected areas. * * * There may also be such a widespread suppuration and disintegration of the broad ligaments, with tubal inflammation, that it is easier to remove all the infected area and to control hemorrhage by a hysterectomy. * * * There can be no doubt as to the necessity of hysterectomy in cases brought to the author's clinic every year and saved by this operation. Suppurative metritis, ulceration of the placental site, streptococcic necrosis of the myometrium, spontaneous rupture of the uterus followed by infection, necrotic fibroids are the conditions demanding hysterectomy."[17]

In a personal communication from Dr. Hirst, dated September 6th, 1922 (in response to his receipt of a report of my 67 cases and a preliminary sketch of my paper), he fully approves of the views expressed in the last edition of his work, stating that those views are the result of some thirty years of special experience in this sort of cases. Some ten years ago an assistant looked up the records and found that he had operated on a very large number of cases of puerperal infection of all sorts, and that number would be much larger if investigated at the present time.

He says: "The indifference to the operative treatment of cases in which operation is really indicated is due to the indisposition of most hospitals to admit such cases. I have a special department which is usually full of cases from the outside as it is known that I wish them for purposes of study and teaching. I entirely agree with the views you express and hope they will more generally prevail as I am sure they are correct. * * * The women you have operated upon I am convinced would have died without the operation. What chance have

streptococcic necrosis of the myometrium; cornual abscesses; intraperitoneal suppuration, or pelvic abscesses?"

One of the most prominent surgeons in the East, to whom the cases and paper were submitted but who does not wish his name to be used, writes: "I have carefully read your paper and reports of cases and I am of the same opinion as yourself. Dilly-dallying, pussy-footing, and incompetency on the part of gynecologists are responsible for much."

According to Jellett, of the Rotunda Lying-In Hospital, Sippel and others, the death rate without operation in the class of cases described in this paper is practically 100 per cent. In a large consultation practice I have seen many cases of puerperal infection. Most of them were cases of simple sapremia, many of which developed marked symptoms of infection with chills, fever and sweating, but with prompt recovery; though occasionally there developed a pelvic abscess, either in the culdesac or in the broad ligament, which required opening through the vagina. The others, however, with quite similar symptoms but with different pelvic conditions, invariably died of sepsis, usually after the lapse of several weeks. *In not a single instance of the serious type was there recovery.* During a surgical experience, the magnitude of which is indicated by carefully kept records of nearly 15,000 abdominal sections, and with histories of many thousands of patients upon whom no operations were made, I have many records of patients who recovered from simple puerperal infection, but *not a single one of recovery in which the history indicated an infection of the character discussed in this paper.*

The hopelessness of the type of infections in Class 5, has apparently always been recognized by experienced obstetricians and surgeons. Thus, a quarter of a century ago, Egbert H. Grandin and George W. Jarman[18] write as follows: "Unfortunately, septic metritis, salpingitis, and oophoritis, when developing during the puerperium, are of such a virulent type and the associated general systemic infection is so profound that we can expect but one result, no matter what the therapeusis, and this result is death. * * * There are now and then recorded cases where aggressive surgery has resulted in ultimate recovery. * * * The object of the operation being to remove from the body the source of the systemic infection, ablation of the involved organs must be thorough; that is to say, * * * the entire uterus with the appendages must be removed."

It seems to me evident, therefore, that recoveries, if they ever occur, are so rare that every such patient who recovers after a surgical operation owes her recovery absolutely to that operation, and that no matter what the operative mortality may be, each such patient is

entitled to the benefit of operation if any competent operator is at hand.

The cases reported embrace all upon which I have operated. The original notes are much fuller in detail, but the salient points appear here with sufficient fulness. (The figures following the numbers refer to the full histories, which can be furnished to any one seeking complete details. The names of the attending physicians are omitted for manifest reasons, but the cases were referred to me by fifty-eight different physicians.)

During the past year, while preparing this paper, I have taken particular pains to discuss the subject with many physicians, individually and in groups as I meet them, and almost invariably I get reports of isolated cases of Class 5, but in all of them without exception a fatality ensued, barring one in which hysterectomy was done with complete recovery.

As my statistics show 47 recoveries out of 67 cases, I feel that there can be no question as to the propriety of operative intervention, or as to the great benefits to be expected from that intervention. My death rate could easily have been made better by refusing to operate on several of the worst cases, and yet one of the very worst, as indicated by her condition and history (No. 34), made a prompt recovery. That several of those that died would have recovered had there been earlier intervention, as in Nos. 3, 20, 58, etc., or had the operation been more radical, is self-evident.

If the operations advised by those who have merely ligated the thrombosed veins, with a mortality of 60 per cent, are justifiable, then certainly the more radical operation, usually for more serious conditions, with a mortality of less than 30 per cent, is beyond question advisable.

The technic used in all these cases, when not otherwise specified, consisted in making a panhysterectomy by the method described by me in a paper read before the American Association of Obstetricians and Gynecologists at Indianapolis, September, 1916.[19] The important features of that operation in this class of cases consist in:

(1) The patient should be placed as a rule in the Trendelenburg position, after thorough cleansing of the vagina and sterilizing of vagina and uterine cavity by injecting tincture of iodine. (2) Unusual care should be exercised after the abdomen is opened to build a coffer dam to protect the general abdominal cavity. (3) After the parts are sufficiently exposed the infected veins should be cut across, but *should not be ligated*, since absolutely free drainage is desired. (4) The arteries should be isolated and ligated as necessary, and catgut only should be used since silk ligatures become infected and might materially retard convalescence. (5) Where the culdesac is unusually

deep, the posterior vaginal wall should be split down so as to secure better drainage. (6) Attach the round ligaments to the vault of the vagina on each side so as to hold it up during the healing process. (7) Pass an iodoform gauze fluff down into the vagina, leaving most of the material to lightly fill the pelvis. (8) Over this swing around the sigmoid colon and attach it around the pelvic margin so as to make a complete floor of the abdomen and roof of the pelvis. In this way there is little risk of a general peritonitis, while the pelvic drainage is amply provided for, including the drainage into this gauze fluff, and then into the vagina, of the infected thrombosed veins. This gauze fluff is left in place for one week and then withdrawn. The open vagina gives ample drainage, and healing takes place rapidly. If, as was done in several cases, the uterus is not removed, the culde-sac is widely opened into the vagina, the end of the gauze fluff introduced through that opening, and the rest of the technic as before.

Hysterectomy, under the conditions present in these infected cases, is not an operation for a tyro or for the operator whose abdominal work is practically limited to cesarean sections. The patient is in poor condition to withstand a prolonged operation and about thirty minutes should be the limit if satisfactory results are to be secured.

CONCLUSIONS

Without operative intervention, all of these patients die. In those rather rare cases in which the disease is practically limited to the ovarian veins, ligation of the veins above the thrombus is feasible, but the death rate, as shown by Miller, is not less than 60 per cent. Radical operation with free drainage of all the infected veins, and usually with hysterectomy, according to the results obtained in sixty-seven consecutive cases, gives a death rate of a little less than 30 per cent, or about one-half that of ligation, and that, too, in a more serious class of cases.

Puerperal infection, in brief, is simply wound infection, and should be treated on general surgical principles. The puerperal state confers no immunity but rather the reverse. All surgeons recognize the gravity of a neglected palmar abscess, or a wound received in operating or dissecting. Ear specialists long ago learned the vital importance of cleaning out, with ligation if necessary, the thrombosed internal jugular vein in case of lateral sinus infection due to disease of the mastoid; and there is certainly a striking similarity between an infected thrombus in the jugular and the same in the veins of the pelvis.

In all of these, and many similar, conditions what old Professor Joseph Pancoast used to call the "antiphlogistic touch of the therapeutic knife" is recognized as of absolute therapeutic importance.

CASE REPORTS

1. R. 11-442.—Mrs. W. H. N., age thirty-six; one child aged 17. Patient had been delivered three days before of a macerated child weighing eight pounds. The dystocia was due to the presence of a large fibroid involving the lower portion of the uterus. The fetus had been delivered, but the afterbirth was in the uterine cavity above the tumor, the cord having been torn off. Marked febrile disturbance was present, with a pulse of 140. Conditions indicated a necrotic fibroid. On section much discoloration of the tissues was present, and a large necrotic fibroid. A panhysterectomy was made in the usual way. Excellent recovery.

2. R. 11-454.—Mrs. W. A. O., aged thirty-eight; number of children, three. Patient had had a miscarriage a year or two before, with some sepsis. Two weeks before had had another miscarriage. Her husband (a physician) said that everything came away apparently all right, but she soon commenced having chills and fever. Examination showed a mass to the left of the uterus very tender, evidently an abscess high up, but I expressed the hope that it could be reached through the vagina. When under the anesthetic found conditions such as to render it unwise to do anything from below. On opening the abdomen found an abscess to the left involving the left side of the uterus, together with the tissues of the left broad ligament, the ovary and tube. A panhysterectomy was then made, leaving the appendages on the right. Patient was placed in the Fowler position. Examination of the specimen showed the left half of the uterus to be filled with multiple abscesses, these abscesses extending into the broad ligament which was more or less infiltrated. Uninterrupted recovery.

3. D. 11-691.—Mrs. F. W. W., aged thirty-four; three children, the youngest eight weeks. Labor normal; pelvic infection appeared three days later; chills, fever, sweating. Examination showed a mass back of the cervix which apparently could be opened and drained through the vagina. Under an anesthetic made an opening, but found the contents serum and above this a solid mass evidently the source of the infection. On opening the abdomen found this mass made up of the sigmoid with greatly thickened walls, the uterus and the appendages. Multiple abscesses were found present in this mass. Abscesses present both back and in front of the uterus, and in the walls of the uterus. The involvement was so extensive that a panhysterectomy seemed unwise as the patient's condition was desperate. Accordingly the necrotic tissue front and back was removed, and drainage introduced through the vagina, and through the lower end of the incision. The operation was completed rapidly, but the patient was almost pulseless. Salt solution was at once used, but she failed to rally and died of shock in about one hour.

4. D. 12-10.—Mrs. D. A. R., aged twenty-eight; one child aged six. After several days of illness had completed a miscarriage at about three months, about one week before. The next day had chill with a temperature of 104°; vomiting. Examination showed the uterus enlarged, with a hard mass to the left; very tender. Leukocytes 29,400, polymorphonuclears 90.4 per cent. Examination under the anesthetic showed nothing different. On opening the abdomen found extensive adhesions covering the fundus; inflammatory mass on each side, both tubes and ovaries being involved, chiefly on the left. A panhysterectomy was made in the usual way. Because of the extent of the infection, and the involvement of the adjacent small bowel, the prognosis was very guarded. Examination of the specimen showed the usual infiltration of the walls of the uterus. Patient improved materially after the operation, but the septic condition continued, and she died a little over a month later.

5. R. 12-262.—Mrs. J. W., aged thirty-five; 11 children, the age of the last five weeks. Infection appeared soon after the birth of the child; chills, pain in the right side, vomiting, etc. There being no improvement she was brought to the hospital. Examination showed a mass back of the uterus extending up on both sides, particularly the right. On opening the abdomen the adhesions were extensive, but were readily separated. The uterus was found retroverted, and firmly adherent. To its right was a mass feeling much like a misplaced kidney, but this was found to contain an abscess covered by a loop of small bowel. The adhesions were separated, and the uterus brought up. As the body of the uterus seemed to be undergoing fair involution, the tubes were removed, and the round ligaments implanted so as to hold the fundus forward. The left ovary was saved. The vagina was then opened and a gauze fluff introduced as usual. Examination of the small bowel showed it to be in bad shape, and accordingly about two feet of bowel were removed, and a lateral anastomosis made in the usual way. Smooth convalescence.

6. R. 12-342.—L. K., aged fifteen; one child aged one week. Patient had had a rapid pulse for sometime before the birth of her child, and after delivery continued to have a rapid pulse with elevation of temperature, reaching 105.6°; pulse 140. Much nausea; normal lochia. Examination showed fair involution of the uterus but a mass of inflammatory exudate posteriorly. Everything very tender. On opening the abdomen found involvement of the right ovarian vein. It was filled with infected clot. A pan-hysterectomy was made in the usual way. Examination of the specimen showed extensive infection of the placental sight, but no abscess in the uterus itself. Uninterrupted recovery.

7. D. 12-703.—Mrs. H. W., aged thirty-six; eight children, age of youngest four years. Patient had miscarriage at four months, one month before. Had chills before the miscarriage took place. These continued twice daily with high fever; much nausea and vomiting. To the left of the uterus and high up could make out a hard mass attached to the pelvic wall. It could just be felt through the vagina. On opening the abdomen found this mass as expected. The veins were filled with infected blood clot. A panhysterectomy was made, except that the right ovary was saved. The ovarian veins on that side were found filled with infected clot. Examination of the specimen showed multiple abscesses scattered all through the uterine musculature. She rallied nicely after the operation, but there was no improvement in her general condition except that the chills were not so frequent. She gradually grew weaker, and finally comatose, and died on the fifth day.

8. D. 13-25.—Mrs. J. B., aged twenty-eight; four children, youngest three years. Patient had had a miscarriage three weeks before at about one month. Although quite sick she had not been seen by any physician until a few days before. Had had chills, fever, etc.; temperature, 104°; was very septic. Examination showed a mass on each side of the uterus. Leukocytes 22,000, poly. 91.6 per cent. Twenty-four hours later her condition seemed worse, and operation was advised. Made the the usual panhysterectomy. Examination of the specimen showed the infection apparently limited to the walls of the uterus at the point of attachment of the placental tissues. The temperature dropped after the operation, but she continued in a stupor, and died on the fourth day.

9. D. 13-36.—Mrs. D. E. B., aged thirty; three children, the youngest three years. Patient had miscarried six weeks before of a two months' pregnancy. This miscarriage was followed by chills, fever, sweating, etc. Had been gradually getting worse. Examination showed the uterus fixed by a mass off to the left. Under an anesthetic the infection was found involving the tissues so high up as to render it undesirable to attempt to open from below. On opening the abdomen found the

infection in the left broad ligament extending along the ovarian veins. The appendages on the right normal. The left tube and ovary edematous. The left horn of the uterus, and the appendages on that side were then removed, but the body of the uterus seemed to be practically normal.

Patient improved materially after the operation. No more chills, but the elevated temperature continued. About two weeks later there was evidence of infection in the opposite broad ligament, and accordingly after a few days' delay that abscess was opened through the vagina, and exit given to several ounces of offensive pus. Cavity drained. Patient improved materially after this, but continued to have some elevation of temperature; pretty good appetite. She died suddenly thirty days after the original operation, apparently from a thrombus of the pulmonary artery. A panhysterectomy in this case would probably have been the wiser procedure.

10. R. 13-93.—Mrs. C. P. C., aged thirty-one; two children, the youngest aged one year. Patient had had a miscarriage three weeks before as the result of an automobile accident. This was followed by some febrile disturbance; many chills. Examination showed a hard mass to the left of the uterus. Under an anesthetic this abscess was opened through the vagina, and drainage introduced in the usual way. Following this her condition improved materially after a while but then stopped, and more trouble followed, with involvement on the right side. Could still feel some infiltration to the left as well. Examination under the anesthetic showed a mass on both sides, and behind the cervix. On opening the abdomen found the omentum firmly adherent. Adhesions were separated; these involved chiefly the sigmoid. On separating them there was a gush of pus from under the sigmoid. This pus had been burrowing in front of the uterus. Separation of further adhesions showed a similar abscess on the right side. Further separation of adhesions showed the tubes completely disorganized. As the body of the womb seemed to be in fair shape it was fastened forward and then ample drainage introduced into the vagina through the culdesac, and the sigmoid rearranged over everything so as to cover the gauze fluff. Rapid convalescence.

11. R. 13-169.—Mrs. E. R. D., aged twenty-eight; no children. Patient had had a miscarriage at two months, one month previous. This was followed by evidence of infection. She was in the hospital under observation for about one week, but septic conditions getting steadily worse she was operated upon. At that time there was considerable abdominal distention from some peritonitis, with much resistance at the vault of the vagina. On opening the abdomen there was a gush of thin, offensive pus, and the exposed intestines were bathed in this pus. On exposing the fundus found an opening from which the infection had apparently come. A hysterectomy was therefore made in the usual way. Examination of the specimen showed the opening in the uterus to admit the tip of the finger. Excellent recovery.

12. R. 13-224.—Mrs. G. V. F., aged forty; children four, youngest one month. The last child had been delivered instrumentally after having been dead for several days. Infection followed immediately. Lochia normal. Examination showed a hard mass back of the cervix and filling the pelvis, extending two inches above the pubes. This seemed to include a fibroid in the posterior wall of the uterus. Examination under the anesthetic showed nothing new. At the operation found the necrotic fibroid as anticipated with other fibroids present. A panhysterectomy was made in the usual way. As there was no pus on the outside and the necrotic fibroid had not been opened into, incision was closed without drainage. Patient was then placed in position, and the posterior vaginal wall and perineum repaired. Examination of the specimen showed the necrotic fibroid as anticipated. Prompt recovery.

13. R. 13-459.—Mrs. M. M., aged thirty-eight; four children, the youngest five. Patient had miscarried at seven weeks, two weeks before. This was followed by much pain, vomiting, and fever; no distinct chills. Had been getting worse right along. Examination showed a tympanitic abdomen with a mass filling the pelvis and lower abdomen. Everything exceedingly tender and the parts fixed; evidently a local peritonitis present. Under the anesthetic made out the uterus distinctly and a mass on each side. Opened the culdesac through the vagina. This gave exit to some necrotic tissue, but showed much pathology higher up. On opening the abdomen found as expected a good deal of local peritonitis present. Separating adhesions there was a gush of pus from in front of the uterus. Another cavity was found on each side, extending well out. A panhysterectomy was made as usual. Patient's condition was desperate. The stomach was washed out on the table, and saline ordered under the breasts. Examination of the specimen showed all the tissues removed to be infiltrated. Both tubes full of pus. Rapid convalescence.

14. R. 13-537.—Mrs. L. P., aged twenty-six; two children, youngest aged nine weeks. Patient had not been well since the birth of her first child; had placenta previa with the second child, but the baby was born alive. She seemed to get along fairly well for some days, and then evidences of infection on the right side set in, with a sweating and daily exacerbation of temperature. Patient was found anemic and septic. Mass on the right side as previously mentioned. This was high up. Under an anesthetic decided that the abscess on the right could not be prudently drained from below. Everything was fixed and solid. On opening the abdomen found as expected that everything in the pelvis was firmly fixed with extensive adhesions of the omentum and intestines. These adhesions being separated several pockets of pus were opened. The uterus was found retroverted and extensively infiltrated; very friable, so that a portion of it was torn off in bringing it up. Its removal was finally accomplished. Prompt recovery.

15. D. 13-688.—Mrs. F. T., aged twenty-seven; one child aged two weeks. Patient had been delivered by forceps of a dead child, a little more than two weeks before. Some laceration of the perineum with immediate repair. A few days later she commenced having daily chills, with a temperature of 105°. Some vomiting. Examination showed imperfect involution with retroversion and extensive adhesions. Hemoglobin thirty-two per cent; leukocytes, 25,200, poly. 90.8 per cent. No gross pathology could be made out in either of the broad ligaments. Advised examination under an anesthetic as her condition was rapidly becoming desperate. Under the anesthetic nothing new could be made out. Could pass the finger into the uterine cavity, but everything there was found clean. On opening the abdomen found the right ovarian vein filled with infected clot. The uterine walls very friable. Made the usual hysterectomy. There was a gush of black and very offensive bloody pus on cutting across the ovarian vein, about two drams in all. Examination showed no abscesses in the wall of the uterus, though the placental site looked unhealthy. Following the operation the vomiting ceased, but the temperature continued elevated and the pulse rapid. She died on the third day suddenly with the usual symptoms of pulmonary embolism.

16. R. 13-696.—Mrs. J. T., aged twenty-seven; number of children four, the youngest three weeks. The child was born after an easy labor of three hours. Her physician noticed at the time of delivery that she had a little elevation of temperature. The next day it was 102.6°. The febrile reaction continued and after ten days she commenced having distinct chills; temperature 105½°; daily chills; rapid respiration; much sweating; lochial discharge normal. Hemoglobin 65 per cent; some pus in the urine. Examination showed much tenderness to the right of

the uterus, but no distinct tumor. There was evident involvement of the left broad ligament and a well-marked lump at that point. On opening the abdomen the infection was found in the left broad ligament, extending up the left ovarian vein. The left tube edematous. The tissues on the right practically normal. A panhysterectomy was made in the usual way, saving the right ovary. Much pus discharged on cutting across the ovarian vein. Examination of the uterus showed a general infection of the left side. Prompt recovery.

17. D. 14-178.—Mrs. E. M. E., aged twenty-six; one child aged five days; forceps delivery. Thirty-six hours later she had a chill, and a temperature of 105°; daily chills after that. Leukocytes 30,000, poly. 92.5 per cent. Examination showed a deep laceration of the cervix on the right side; an ill-defined tender mass in the left broad ligament; nothing on the right. Lochia normal. Advised a few days' delay, but the delay accomplished nothing, as her general condition continued as before, with greater evidences of infection. The day before her operation examination showed marked tenderness in both broad ligaments. At the operation the uterus was found involved with infection of both round ligaments. The uterus was removed in the usual way. Examination showed minute abscesses in the wall on each side corresponding to the attachment of the broad ligaments. The entire surface was black, and apparently gangrenous, and sloughing. For forty-eight hours the patient's condition seemed to be materially improved, but her pulse and temperature still remained up as before. The symptoms of sepsis continued, and she died rather suddenly, apparently from pulmonary embolism, on the fourth day.

18. R. 14-496.—Mrs. E. C. O., aged twenty-nine; four children, the youngest six weeks. Patient was delivered of her last child normally, but soon after commenced having pain low down on the right side. This diminished, and she seemed fairly well until about a week before. Lochial discharge normal. She suddenly became much worse, with pain in the right side. Some vomiting. Chilly sensations, but no distinct chill. Leucocytes 14,000, poly. 88.6 per cent. Hemoglobin 32 per cent. Reds 2,856,000. Examination showed tenderness over the right side from the gall bladder down. Back of the cervix everything was found very tender, too tender for any satisfactory examination. No evidence of any involvement of the kidney. Possibly some involvement of the gall bladder. Examination under the anesthetic showed much pelvic trouble with extensive adhesions posteriorly. On opening the abdomen found the gall bladder and kidney normal. Uterus boggy and adherent. Both tubes infected, together with the body of the uterus. A panhysterectomy was made in the usual way, saving one ovary. Because of patient's weak condition saline solution was introduced through a vein. Examination of the specimen showed the walls of the uterus to be infiltrated, and the broad ligaments as well. Smooth recovery.

19. R. 14-566.—Mrs. C. B. S., aged twenty-six; three children, the youngest 18 months. Patient had miscarried at three months about one month before. This was followed by pelvic inflammatory trouble; chilly sensations and more or less fever. The doctor thought there was a bulging in Douglas' culdesac. Examination showed the uterus to be retroverted, and everything back of the cervix to be hard, brawny and very tender. No evidence of abscess unless deeply seated. Examination under the anesthetic showed nothing new. On opening the abdomen found the uterus retroverted, and firmly adherent. Both tubes much thickened, and both ovaries involved in the inflammatory mass. Made a panhysterectomy in the usual way. Examination of the tissues showed them to contain much inflammatory exudate, thoroughly infiltrated with pus. Uneventful recovery.

20. D. 14-665.—Mrs. W. E. T., aged twenty-four; one child aged two months. Patient had been delivered with forceps, with laceration of the perineum and

immediate repair. Nine days after chills and fever developed, with pronounced symptoms of sepsis which had persisted. Had had two pneumonic attacks in the interval. Some joints involved. Marked pain low down on the right side. Examination showed the patient to be anemic. She was very tender low down on the right side. Everything in the pelvis exceedingly tender, but could make out no distinct pelvic abscesses. A large amount of exudate all through. Under the anesthetic found a well-healed perineum; the uterus enlarged, with a mass off to the right. On opening the abdomen found the right broad ligament infiltrated through and through, the right ovary involved, and the right ovarian vein. Made the usual panhysterectomy. On opening the abdomen there had been an escape of some dirty, somewhat offensive fluid from in front of the uterus. Patient went through the operation nicely, but with the profound sepsis and constitutional involvement, as shown by the affected joints and veins, the prognosis was very unfavorable. Patient placed in the Fowler position. She rallied from the operation very nicely and with little or no shock. The peritonitis which was present continued, however, and she died three days later.

21. R. 15-226.—Mrs. H. H., aged thirty-one. Four children; age of youngest, one year. Labors natural. Had an accidental miscarriage two weeks ago, at two and one-half months. Had had chilly sensations for one week, with temperature reaching 101.8°. Had been vomiting daily for ten days. Was brought in as a case of peritonitis. Examination showed a somewhat distended abdomen, tender low down on the right side. Vaginal examination showed everything in the pelvis exceedingly tender. Could make out a mass back of the cervix and particularly to the right. 19,000 leukocytes, poly. 86.6 per cent.

Examination under an anesthetic showed pus in the pelvis. The culdesac was opened freely, giving exit to a considerable amount of thin, very offensive pus. Washed out the cavity and put in tube drainage.

Patient continued septic and a radical operation was made two weeks later. Under anesthetic a mass could still be felt off to the right, but the original abscess opening had nearly closed. Uterus quite fixed. On opening the abdomen, found the left side of the pelvis in fair shape. On the right side were many adhesions of omentum and bowel. Separating the adhesions, an abscess was found, containing an ounce or two of thin, offensive pus. This was wiped out and the cavity treated with iodine. The parts were then thoroughly separated and an abdominal panhysterectomy made in the usual way. The right ovary was found to have constituted a part of the abscess wall on that side. While separating adhesions of the sigmoid, another abscess was opened into, the walls of which were formed by the small bowel. The appendix was found in the inflammatory mass on the right. It was removed as usual.

Examination of the specimen showed the uterus to be extensively infiltrated and very friable. Rapid convalescence.

22. R. 15-281.—Mrs. J. K., aged thirty-two. Seven children; age of youngest, two years. Labors natural. Patient had miscarried one month before, at four and one-half months. Everything had come away in one mass, but following her delivery she soon developed chills, fever, and sweating, with the usual symptoms of infection. When brought to the hospital, examination showed a much enlarged uterus, quite tender, with a mass projecting somewhat forward on each side. Leucocytes 16,400; poly. 86.6 per cent.

Examination under the anesthetic showed nothing additional, but everything in the pelvis firmly fixed. On opening the abdomen, found everything in the pelvis and about half-way to the navel in one solid mass, but posteriorly the parts were free. Because of the intimate connection of the mass with the bladder, the parts

were freely separated posteriorly and the uterus split. The cervix on each side of the split was caught from below and, by pulling upward, the uterus was thus safely enucleated and removed. Removed section of omentum infiltrated with pus. Prompt recovery.

23. D. 15-380.—Mrs. C. D. M., aged twenty-nine. Four children; age of youngest, two weeks. Although delivery had been normal in this case, patient had a chill on the seventh day after confinement. Another chill the day after. More or less vomiting. When patient was brought to the hospital, she had a temperature of 104°. 17,000 leucocytes; 84 per cent poly. To the right of the uterus could feel a hard mass which extended forward along the wall of the vagina. Patient profoundly septic.

On opening the abdomen, uterus found with no evidence of any trouble on the left side. On the right was a thrombus involving the veins of the broad ligament and running up the ovarian vein. Made a panhysterectomy except for the left ovary.

Examination of the specimen showed a number of pus pockets in the right broad ligament.

Following the operation, abscesses developed in different parts of the body, including some of the joints. The most serious of these was in the right knee-joint, which was finally freely opened anteriorly and posteriorly and drained. There was no improvement, and she died of the pyemia two weeks later, pelvic conditions being fine.

24. D. 15-447.—Mrs. W. E. P., aged twenty-seven. Children, three; youngest, two weeks. Although the delivery was reported normal, patient promptly developed symptoms of infection. Usual chills, fever, and sweating. Highest temperature 104.3°. Some vomiting. Leucocytes 21,000; poly. 94 per cent. Lochial discharge normal from the start. No tympany. Much complaint of pain low down on the left side. When brought to the hospital, patient was desperately sick. The entire infection seemed to be in the veins of the left broad ligament.

When under the anesthetic, this involvement of the broad ligament was made out very distinctly. On opening the abdomen, found the infection involved the left tube and ovary and all of the veins of the broad ligament. Hysterectomy was made by going down on the right side, across, and then up, so as to enucleate everything in one mass.

Examination of the specimen showed the entire left side of the uterus honeycombed with abscesses, with distinct abscesses in its posterior wall.

Patient continued to have chills after her operation, with high fever and a general condition of septicemia, from which she died on the ninth day after operation.

25. R. 16-211.—Mrs. P. G., aged twenty-eight. Children, three; youngest, twelve days. Child born without difficulty. Had a chill forty-eight hours later, with a temperature of 104°. Usual fluctuations of temperature, with chills, fever, and sweating. Temperature 105.5° the day of her entry into the hospital. Persistent headache. Steadily failing. Examination showed tenderness on each side of the abdomen. Vaginal examination showed tenderness low down on each side of the uterus, particularly to the right and here there was marked infiltration. Uterus somewhat movable. Leucocytes 14,000; poly. 84.4 per cent.

Under the anesthetic, the main trouble was found, as previously determined, in the right broad ligament. On opening the abdomen, found a large amount of exudate in the right side, a small amount on the left. Removed the uterus by going down on the left side, across, and then up.

Examination of the uterus showed a number of abscesses in the right wall, with a similar, although less marked, condition in the left wall.

Smooth recovery.

26. D. 16-283.—Mrs. J. P. H., aged twenty-seven. Children, four; last delivery ten days before. Delivery was rapid under pituitrin. On the third day, there was a chill with a temperature of 105°. Other chills followed. A puncture had been made through the vagina into the right broad ligament a few days before, but no pus obtained. The surgeon's finger was introduced following the puncture, but nothing more found. Usual maximum temperature about 104°. Leucocytes 30,000; 88 per cent poly. Examination showed a mass involving the entire right broad ligament. Everything exceedingly tender. Cervix patulous. No odor.

Under an anesthetic, found the interior of the uterus entirely clean. On opening the abdomen, found an abscess at the left horn of the uterus. Otherwise, the parts on that side in good condition. On the right side, great infiltration of the broad ligament with involvement of the ovarian veins. Ovary much swollen and covered with inflammatory lymph. The ovarian veins presented a mass about the diameter of one's thumb. Made the usual hysterectomy. Patient went through the operation in good shape. Late in the night she developed restlessness, air-hunger, with rapid breathing, and failing heart, and died at 5:00 A. M., apparently of a clot in the right heart.

27. R. 16-395.—Mrs. E. R. M., aged twenty-two. One child, age two weeks. Patient was delivered after a labor of twenty hours. Pituitrin had been given. Three days later had a chill, with a temperature of 102°; 29,400 leucocytes. Had been having continuous chilly sensations with sweating and some vomiting. No milk had appeared. Was seen at a foreign hospital. Abdomen distended and very tender low down on each side. Much exudate throughout the entire pelvis. Uterus firmly fixed. Could make out no pelvic abscess through the vagina.

Two weeks later the patient was seen again, her septic condition having continued. Examination showed no collection of pus in the pelvis, but the same general matting as previously found.

On opening the abdomen, found the uterus retroverted, with extensive adhesions of intestines and omentum in the pelvis. Both tubes were found the seat of infection and the right ovary much swollen. The body of the womb seemed to be in fair shape. Both tubes were accordingly removed, and the right ovary. No drainage necessary.

Prompt convalescence.

28. R. 16-453.—Mrs. C. B. Q., aged twenty-five. Four children; age of youngest, two months. Although patient's child was born normally, it was very large (fourteen pounds) and following the confinement she became mildly septic and had been failing for the two months. Everything tender. Examination showed the uterus enlarged, completely retroverted, firmly adherent and everything excessively tender. Pelvis filled with a common mass. Leucocytes 18,400; 88.6 per cent.

Examination under the anesthetic failed to show any pelvic abscess. On opening the abdomen, found the parts as previously determined. On the right side, above the uterus, was a mass clearly containing pus and involving the right tube and ovary. Extensive adhesions everywhere but the left ovary seemed healthy. A panhysterectomy was made in the usual way except that the left ovary was saved. An abscess was found in the left broad ligament and everything exceedingly friable, so that hemorrhage was not easily controlled.

Examination of the specimen showed an abscess in the right ovary and in that tube, and in the connective tissue in the neighborhood. Multiple abscesses in the right broad ligament, close to the uterus.

Excellent recovery.

29. R. 17-290.—Mrs. C. F. J., aged twenty-seven. One child, age two weeks. Patient's labor was entirely normal and easy. The third day, temperature shot up rapidly and had been about 104° since then and she had been doing badly right along, with increasing leucocytosis. Examination showed fair involution and at no point any pathology. In the absence of repeated chills, advised delay. Three days later a second examination showed a very typical mass on the left side of the uterus.

Examination under an anesthetic the next day showed the uterus to be firmly fixed with a hard mass off to the left but no evidence of an abscess which could be reached through the vagina. On opening the abdomen, found extensive adhesions, particularly on the left. These being separated, numerous small abscesses appeared involving each broad ligament and infection extending up each of the ovarian veins. Tissues around these veins much infiltrated and ovaries much swollen. The infiltration also involved the round ligaments. Removed the uterus in the usual way.

Examination of the specimen showed the walls of the uterus on each side filled with small abscesses about the size of peas. Similar abscessed condition found to involve both ovaries. The curious feature of the case was the absence of chills, notwithstanding such extensive infection.

Excellent recovery, delayed somewhat by a phlebitis of left leg.

30. R. 17-306.—Mrs. R. F. J. (colored), aged thirty-eight. One child, age 12. Had had a miscarriage three and one-half weeks before, at five and one-half months. Had a chill the night of the miscarriage, but after that seemed to get along fairly well for some days. Had now been having frequent chills, two severe ones the previous day. The doctor, in examining her, had found a fibroid tumor to be present. Examination showed a patulous os, admitting the finger. Could make out a hard mass, very tender, above this. Some tympany. No pus could be found, but necrosis of the fibroid was suspected. 17,600 leucocytes; 86.6 per cent poly.

Examination under the anesthetic showed nothing new. On opening the abdomen, found the uterus to contain a considerable number of fibroids, most of them small. The main portion of the tumor was the uterus itself. Made an abdominal panhysterectomy, but saved the ovaries. Incision closed without drainage.

Examination of the specimen showed several of the fibroids to be necrotic, and two of them thoroughly rotten, with a sloughing fibroid communicating with the uterine cavity. Rapid recovery.

31. R. 17-337.—Mrs. F. K., aged twenty-one. One child, aged six weeks. Labor normal. Patient had a chill, with headache, on the eighth day. Chilly sensations after that. Highest temperature 106°. Got a little better, then had a relapse. Temperature 103°, with chills and much sweating. Examination showed a good perineum, vagina and cervix. Back of the cervix a mass which evidently contained pus. Could not determine the condition of tubes or ovaries because of the tenderness.

Examination under an anesthetic showed that the suspected abscess was simply a mass of infected tissue. On opening the abdomen, found extensive adhesions as expected. These were carefully separated and several pockets filled with inflammatory lymph were opened into. The infection was found on the left side, involving the left tube and ovary and the tissues adjacent. These were removed, removing the tube into the horn of the uterus, which was carefully overcast. Opened the culdesac for drainage.

Patient made an excellent recovery and a year later reported herself in fine shape, three and one-half months pregnant. (See 44.)

32. R. 17-473.—Mrs. A. R., aged twenty-five. Four miscarriages; no children. Patient's last miscarriage was induced a month ago. Had been chilly but without

distinct chills. Highest temperature 104°. Vomiting. Steadily getting worse. A lump developed in the right side and she was brought to the hospital with a diagnosis of pelvic infection, with peritonitis as a complication. On examination, she was found with a rapid pulse, tympanitic abdomen, and tender all over. Looked very sick. To the right of the cervix and back of it, a hard mass which seemed to be a tuboovarian infection but no distinct evidence of pus.

Under the anesthetic nothing more could be determined. Uterus firmly fixed. Incision revealed extensive adhesions burying the uterus. These being separated, there was a gush of thin, offensive pus. Adhesions being further separated, a tuboovarian abscess was found on the right side, with an old infection of the tube on the left, but the left ovary normal. Removed both tubes and the right ovary. Rapid recovery.

33. R. 17-653.—Mrs. O. W., aged forty-two. Children, seven; youngest 10 years. Miscarried two weeks ago at two months. Had some trouble in the left side of the pelvis for about three years; worse at the menstrual periods. Had a chill following her miscarriage and had had nine chills altogether, all followed by high fever and sweating. Much vomiting. Examination showed the uterus enlarged and firmly fixed. Everything quite tender. Diagnosis: Thrombophlebitis of the pelvic veins.

Under the anesthetic, could feel, off to the right, a hard mass high up, which seemed to be clearly the infected veins. On opening the abdomen, found the parts as previously determined. On the right side was an infected mass the size of a thumb, running up with the ovarian vein. The right ovary was adherent. The left ovary and tube normal. Made an abdominal panhysterectomy but saved the left ovary and tube.

Examination of the specimen showed a point of infection at the right horn, not in itself serious, but the veins on the right were found to have been plugged with clots, several of which showed typical infection.

Rapid convalescence.

34. R. 18-127.—Mrs. R. C., aged twenty-eight. Children, three; age of youngest, two years. Labors normal. Had a miscarriage seven weeks ago, of a six months' pregnancy; no known cause. Placenta removed manually three days later. Then had chills, with high fever and sweats. For the last four weeks the left leg has been drawn up nearly to a right angle and she has been sore all through that side. Examination showed the uterus enlarged, firmly adherent, particularly on the left side. Diagnosis: Thrombophlebitis, with extension along the psoas muscle.

Examination under the anesthetic showed nothing new. On opening the abdomen, found the uterus firmly adherent on the left side, with much thickening of that broad ligament and a mass extending along the course of the left ovarian vein. The uterus was removed in the usual way but the right ovary and tube were saved. In separating the adhesions on the left side, after removing the uterus, found an abscess extending up along the ovarian vein in close relationship to the psoas muscle, as had been anticipated. The opening was enlarged, the abscess cleaned out and the cavity lightly packed with gauze. Mobilized the sigmoid to cover everything. An incision was then made into the loin, so as to reach the abscess posteriorly for more complete drainage.

Patient went through the operation nicely and made a very satisfactory recovery. March 19, 1922, received a letter from her, telling of excellent health, although still having some soreness in the left side but nothing to interfere with her general comfort.

35. R. 18-244.—Mrs. I. H., aged twenty-three. Two children; age of youngest, two years. Patient had induced a miscarriage one week before by injecting water into the uterus. This was followed by repeated chills with fever. Pulse 136, tem-

perature 104.8° when she entered the hospital. Had been vomiting more or less. Had had much pain and sinking spells. Examination showed everything through the lower abdomen exceedingly tender. Vaginal examination revealed the same. Leukocytes 29,000; 91.8 per cent poly.

Under an anesthetic examination showed a central mass well filling the pelvis, with exudate on each side. On opening the abdomen and separating adhesions, found the pelvis filled with dirty fluid and much inflammatory lymph. More infection on the left side than on the right. Made a panhysterectomy as usual, but saved the right ovary and tube. The specimen was turned over to the pathologist, who reported a streptococcus infection.

Patient improved rapidly, except for infection of the incision, and went home in good condition.

36. D. 18-464.—Mrs. C. P., aged twenty-nine. Children, six; age of youngest, two weeks. Patient seems to have had a normal confinement, but two days later commenced having chills which were repeated daily. Usual fever and sweating. No vomiting. Examination showed the uterus enlarged, firmly fixed; patient decidedly septic. Leucocytes 22,000; poly. 89 per cent.

Examination under the anesthetic showed the main trouble to be on the right side, in the right broad ligament. On opening the abdomen, found the uterus as previously determined. No trouble on the left side. On the right side the tube, ovary and broad ligament were much inflamed and much pus was present. A panhysterectomy was made in the usual way. In doing this, many small abscesses were opened. Examination of the specimen showed the interior of the uterus to be sweet and clean. In the right wall of the uterus were many abscesses and similar abscesses in the connective tissues on that side.

Patient came out of the anesthetic nicely but with a rapid pulse which continued until her death. She reported herself as feeling fine and for thirty-six hours there was hope of recovery except for the continued rapid pulse. No further chills and only moderate elevation of temperature. On the third day she was doing so well that her husband went home, but late that evening her pulse became suddenly very rapid and she died about noon the next day.

37. R. 18-470.—Mrs. J. P., aged thirty-eight. Children, twelve; age of youngest, five weeks. Patient's labor was entirely normal and she got up, as usual, on the third or fourth day, but soon after commenced having chills with high fever. Her physician had been washing out the uterus with antiseptics. Temperature yesterday 104.5°. Patient was apparently in collapse when she reached the hospital. Examination showed an exceedingly tender mass back of the cervix and high up, but could make out no abscess.

Under the anesthetic found that the mass referred to was a retroverted fundus. Uterus much larger than it should have been after five weeks. Could make out nothing wrong in the broad ligaments or appendages. On opening the abdomen found the parts as previously determined. The enlarged fundus was brought up and the uterus removed, the appendages being saved. In closing the incision, repaired an umbilical hernia in the usual way. As the patient had improved in general condition by a night's rest and had gone through the operation beautifully, she was placed in position and the usual repair made of the perineum and vagina. Examination of the specimen showed many small abscesses involving each side of the uterus and scattered more or less through its walls. Endometrium entirely clean.

Unusually prompt recovery.

38. R. 18-660.—Mrs. A. W., aged twenty-six. Children, two; age of youngest, one week. Patient's child had been born naturally but she had repeatedly tried to

abort herself, having used a catheter only a few days before its birth. Very shortly after the birth of the child she had a chill followed by several lighter chills and a severe chill yesterday. Yesterday her physician washed out the uterus with an antiseptic. Examination showed a patulous cervix, so that the finger could readily pass to the fundus. Everything clean on the inside. Uterus enlarged, as expected, and adherent. Could make out no pus at any point. On reaching the hospital, a leucocytosis of 24,000 was found, with 87 per cent poly.

The next morning, under the anesthetic, could make out a distinct hardening on the right side. On opening the abdomen, found a thickening of the right broad ligament, with an involvement of the ovarian veins on that side. Right tube and adjacent parts edematous. Nothing wrong on the left. Made a panhysterectomy in the usual way, but the left tube and ovary were saved. Examination of the specimen showed the interior to be quite clean, with a bunch of infected veins on the right side, containing pus and necrotic blood clot. On the inside of the uterus, corresponding to these veins, was a grayish patch of infection and infected clots could be traced passing through the wall of the uterus.

Excellent recovery.

39. D. 18-663.—Mrs. H. B. W., aged twenty-five. Children, two; age of youngest, six weeks. Patient's last confinement was at a local hospital and was instrumental. She insisted on going home the next day. Was taken sick four days later. After twelve days had a good deal of pain low down on the right side. Two weeks ago had a chill and sinking spell. Temperature has been running from normal to 107°. Vomited a good deal for a while, then got better, but had been vomiting again for two days. Examination showed the patient to be anemic and yellowish in color. Decidedly septic. Uterus enlarged, displaced backward, and very tender. Could make out a distinct mass in the right broad ligament. No distinct abscess. Patient was brought to the hospital, where she was found to have a leucocytosis of 24,000, with 84.6 per cent poly.; pronounced anemia.

Under an anesthetic the next day, could make out nothing. On opening the abdomen, found the parts as previously determined. Found several abscesses in the right broad ligament. None of them large. Omentum extensively adherent. Right ovary enlarged and containing pus. Ovarian vein as large as one's thumb, with infiltration alongside. Uterus removed as usual, saving the left tube and ovary. As abscesses had been found between the uterus and the anterior abdominal wall, a wick was introduced at the lower angle of the incision to protect that field. Examination of the specimen showed multiple abscesses throughout the whole right side of the uterus.

Patient came out of her operation in fine shape. Was remarkably free from pain and unnaturally happy. She gradually developed delirium, then a stupor, terminal temperature of 107°, and quietly passed away at 7:00 P.M. the day following the operation.

40. R. 18-715.—Mrs. H. R. Z., aged twenty-four. Children, three; youngest, one and one-half years. Patient was four months pregnant and had been flowing for about three weeks, with an offensive discharge. Could get a very imperfect history as to febrile disturbance. Examination showed an abdominal tumor larger than one would expect at four months' pregnancy. Everything was exceedingly tender. Leucocytes 16,000; poly. 84.6 per cent.

Examination under the anesthetic showed evidence of infection in the pelvis, but no distinct involvement of the veins. Uterus was removed but the appendages saved. Examination of the tissue showed a pregnant uterus with extensive decomposition of the products of conception: surface of uterus discolored and covered with inflammatory lymph.

Patient made an excellent recovery and a few months later wrote that she was in the best of health and had gained fifteen pounds in weight.

41. R. 19-10.—Mrs. W. A, aged twenty-four. One child, aged twelve days. Patient's physician reported that delivery was normal, but that the afterbirth had to be delivered manually. On the third day patient complained of pain in the region of the appendix, where she had had trouble at intervals for several months. Had some fever. No distinct chills, but a good deal of sweating. Lochial discharge free. Patient feeling very sick. Examination showed the uterus firmly fixed, with a very tender mass in the right broad ligament. Leucocytes 30,000; polymorphonuclears 92 per cent. Patient somewhat yellow and clearly septic.

Under the anesthetic could make out the mass in the right side very distinctly. On opening the abdomen, found an abscess in the right broad ligament involving the right tube and ovary and also the right wall of the uterus. Left ovary and tube normal. A hysterectomy was made in the usual way. Examination of the specimen showed the abscess as previously determined, with much purulent infiltration of the right wall of the uterus; its cavity satisfactorily clean.

Prompt recovery.

42. D. 19-117.—Mrs. C. F. C., aged nineteen. One child, aged seven weeks. Labor normal. A few days later she had a chill and high fever. After a day or two she seemed to get better and got up and about. Within a few days again had chills with fever. Since then has had more or less fever, with sweating. Some nausea and vomiting. Pain at first on the right side, then shifted to the left. Has had several slight chills in addition to the severe ones noted. Examination shows patient with a distended abdomen and bad color. Tender over the lower abdomen. Vaginal examination shows everything in the pelvis matted together. Leucocytes 12,800; poly. 87 per cent; reds 3,200,000.

Under an anesthetic the uterus was found firmly fixed, but at no point could any pus be found. On opening the abdomen, found the omentum firmly attached to the brim of the pelvis. These adhesions being separated, a large amount of odorless yellow pus was found. Further examination showed both ovaries to be filled with pus. Everything was adherent, the uterus having been completely buried in these adhesions. The uterus was removed with great difficulty. Examination of the specimen showed both ovaries practically destroyed by pus and walls of uterus infiltrated with pus.

Patient rallied pretty satisfactorily after operation but felt very weak. The weakness continued, with delirium and a failing pulse, and she quietly passed away the afternoon of the next day.

43. R. 19-165.—Mrs. H. C. D., aged forty-one. Children, two; youngest, two weeks. Patient's confinement was normal, although induced two weeks prematurely by an automobile accident which frightened her. Was jaundiced a little before her confinement. Soon after confinement developed a low fever and a few days later a chill with high temperature. Had been complaining of pain in the right side. Examination showed the patient sallow and looking septic. Vaginal examination showed the pelvic organs to be tender, the uterus fixed. Off to the left of the uterus, a very tender mass high up. No odor. Leucocytes 17,000; poly. 82.4 per cent.

Under an anesthetic the uterus was found firmly fixed. A probable abscess, but too high up to open from below. On opening the abdomen, found the uterus adherent posteriorly with an abscess off to the left. On the right side, some adhesions, but the parts otherwise in good shape. Went down on the right side, across, and then up, so as to enucleate everything from below. Found the posterior wall of the

uterus involved in the abscess in front and the sigmoid behind, the latter much infiltrated. Examination of the specimen showed the parts as previously described, with abscesses involving both tubes and ovaries.

Excellent recovery.

44. D. 19-367.—Mrs. F. K. This is the same patient as the one whose case was described in No. 31. She was delivered of her second child after an entirely normal labor, but on the third day was taken with headache and high fever. On the ninth and tenth days she had some uterine hemorrhage with clots; much sweating; some pain in the left side of the pelvis. Symptoms of sepsis had been present in a marked degree for six weeks when I saw her in consultation. Could make out marked tenderness on the left side of the uterus. 13,400 leucocytes, 86.4 per cent poly. Although she was profoundly septic it seemed that an operation would offer her the only chance of relief. On opening the abdomen found the tissues on the right to be in good shape. On the left the omentum and sigmoid were firmly adherent at the left horn, and here there was evidently an abscess. On separating adhesions found the wall of the sigmoid extensively infiltrated and exceedingly friable. It gave way during manipulation, but the parts had been thoroughly protected in anticipation of that occurrence. The uterus was involved in the abscess, and accordingly was removed, saving the appendages on the right. It was found that some six or eight inches of the sigmoid were involved in the inflammatory mass, and accordingly that portion was resected and a lateral anastomosis made in the usual way. The operation was necessarily long, and the patient suffered more or less from shock, though there had been very little hemorrhage. Examination of the specimen showed multiple abscesses in the wall of the uterus, and also in the wall of the bowel. Patient rallied nicely from the operation, but symptoms of infection continued, and she quietly passed away on the seventh day after her operation. An earlier operation in this case would almost certainly have given a different result.

45. R. 19-305.—Mrs. W. L. H., aged twenty-four. One child, aged six. Patient had a miscarriage two weeks ago. Seemed to be all right for about one week. Then commenced to have chills and fever. Cause of miscarriage unknown. The appendix had been removed a year previous. Examination showed a very sick woman. Quite anemic. Fair pulse. Uterus large, exceedingly tender, and very hard. No evidence of a pelvic abscess but marked tenderness back of the uterus and off to the left. Leucocytes 14,000; poly. 85.4 per cent.

Examination under the anesthetic showed the uterus somewhat movable, but fixed by adhesions on the left side. On opening the abdomen, found intestinal loops and omentum covering the left horn of the uterus. Right tube and ovary normal. Detached the uterus on the right side, went across and then enucleated it from below. In separating at the horn of the uterus, an abscess was opened, filled with greenish-yellow, offensive pus. Examination of the specimen showed the abscess had apparently started at the horn of the uterus, but had burrowed down between the layers of the muscle and then given way with an escape of pus into the connective tissue.

Prompt recovery.

46. R. 19-376.—Mrs. E. L., aged twenty. Children, two; age of youngest, 19 days. Patient's confinement seemed to be normal, but soon after she developed a fever, but with no distinct chill. Temperature 104.5° at the first visit of her physician after confinement. More or less sweating. Much pain for several days. Frequent stools. Good deal of abdominal bloating. Examination showed a mass to the right of the uterus, a little in front of the vault of the vagina. Everything tender and fixed. Leucocytes 9,000; poly. 86.8 per cent. As patient's general con-

dition was fair and she had had no distinct chills, advised waiting a little while, with watching of the case, as she was in the hospital under immediate observation. After a delay of nearly three weeks, with patient's condition getting worse instead of better, an anesthetic was administered. This showed the mass previously determined more distinctly but otherwise no special change. On opening the abdomen, found extensive adhesions of bowel and omentum. These being separated, infection was found at both horns of the uterus, particularly on the right, with extensive involvement of the right broad ligament. As adhesions were further separated, the infection was found to involve the right side of the uterus as well. Hysterectomy was made in the usual way, but saved the left ovary and tube. Examination of the specimen showed multiple points of infection involving the horns and right side of the uterus.

Prompt recovery.

47. R. 19-440.—Mrs. P. M., aged twenty-four. Children, three; age of youngest, two weeks; born without difficulty. Two days later patient had a chill, with fever. Thinks she had some chills before the child was born, but without fever. Highest known temperature 104°. Vomiting some during the first days but not of late. Examination showed everything at the vault of the vagina exceedingly tender. Uterus high up and distinctly enlarged. Some tympany. No odor. Pulse 100. Temperature 103.8°. Leucocytes 19,000; poly. 88.4 per cent. As the patient was in the hospital under observation, decided that further delay would be prudent.

As there was a failure to improve, but rather a loss, patient was placed under an anesthetic two weeks later. On opening the abdomen, found infection at both horns of the uterus, particularly at the right, with extensive omental adhesions on that side. Uterus irregular in outline because of the infection. After separating adhesions, the right tube was found much swollen as was also the right ovarian vein, this being swollen to about the size of the thumb. Some infiltration of the right broad ligament. Left tube and ovary normal. Made a hysterectomy in the usual way, but saved the left tube and ovary. Examination of the specimen showed a greatly enlarged uterus with an abscess at the right horn, and thrombophlebitis of ovarian vein.

Smooth and rapid convalescence.

48. R. 19-543.—Mrs. J. O. R., aged thirty-three. Children, five; age of youngest, four years. Patient miscarried two and one-half weeks ago, at about three months. No assignable cause. Patient did well, apparently, for about a week and then developed febrile disturbance with sweating but without chills. No vomiting. More trouble in the left side at first but then more in the right. Some bladder irritation. Examination shows a very sick woman. Flat abdomen. Uterus enlarged, with an irregular mass off to the left, another to the right. Everything exceedingly tender. Leucocytes 14,600; poly. 84 per cent.

Examination under the anesthetic showed distinctly a mass on the left side, less distinctly on the right. On opening the abdomen, found extensive adhesions, particularly on the left side, but these were readily separated. Uterus adherent on the left to the anterior abdominal wall and here there was an abscess containing thick, odorless, green pus. This abscess was beneath the parietal peritoneum and in close relationship to the bladder, thus accounting for the bladder symptoms. Right ovary firmly attached to the horn of the uterus with abscess formation at that point. A panhysterectomy was made in the usual way but saved the appendages on the left. Examination of the specimen showed an abscess in the right horn of the uterus filled with pus similar to that which had been found on the left side. Walls of the uterus, except for these two points, normal and its cavity entirely clean.

Prompt recovery.

49. R. 19-576.—Mrs. E. R., aged twenty-nine. One child, aged one month. Confinement normal. She had a slight elevation of temperature for ten days. Then had a chill and a higher temperature. Had been sick continuously since then with a daily temperature of about 104°. Chilly sensations right along, but no hard chill. A week ago there was a sudden gush of blood and one or two gushes since then but less in amount. Complains chiefly of pain low down on the left side. Has been given antistreptococcic serum. Some tympany, some sweating. Two weeks ago her physician suspected some retention of placenta and used a dull curet, which was followed by some hemorrhage. Patient is decidedly anemic. Abdomen slightly distended and tender on the left side. Considerable exudate into the left broad ligament and the uterus quite fixed. Leucocytes 17,000; poly. 89.8 per cent; hemoglobin 24 per cent; general appearance of blood reported as bad. Patient's condition rapidly getting desperate.

Examination under the anesthetic showed nothing additional. On opening the abdomen, found adhesions of the omentum on the left side. On separating adhesions and lifting up the uterus, found the culdesac smeared with rather thick pus and everything infiltrated. The bladder was detached with much difficulty and a panhysterectomy finally completed with saving of the right tube and ovary. Examination of the specimen showed it to be remarkably pale. A number of sinuses filled with infected thrombi, these thrombi extending out into the broad ligament.

Prompt recovery.

50. R. 19-587.—Mrs. R. J. S., aged thirty-one. Two children, youngest six years. Miscarried a few days ago, at two months. Had been having more or less womb trouble for a number of years. Has been having chills and a good deal of vomiting. Had taken some medicine to secure an abortion but denied any local interference. Temperature 103.5°. Tender over the pelvis, particularly on the left side. Uterus very hard. Hard cervix. Everything exceedingly tender.

Examination under an anesthetic showed the parts as previously determined. Uterus enlarged, with some thickening of the right broad ligament. Was examined by three physicians and all advised prompt hysterectomy. Usual incision was made and the appendages found normal. The body of the womb was accordingly removed in the usual way. Examination of the specimen showed a necrotic condition of the tissues at each horn.

Convalescence uneventful. A year later the husband reported his wife in perfect health, instead of in a condition of chronic invalidism as she had been for a number of years before.

51. R. 19-656.—Mrs. R. B. S., aged twenty-one. Children, two; age of youngest, three weeks. Patient's second confinement was apparently normal, although two weeks' premature because of a fall. The next day she had violent pains through the abdomen, so that opiates were given. Similar pains, though less severe, the next day. After that seemed to feel better, but four days before I saw her suddenly became much worse. Had been having chilly sensations right along. Yesterday had a distinct chill and another one today. Sweating a good deal. No vomiting. Her physician had made a presumptive diagnosis of pelvic abscess. Examination shows the uterus quite fixed by a large amount of exudate, particularly in the left broad ligament; some apparently in the right. Everything excessively tender.

Examination the next day, under an anesthetic, showed nothing new. Could distinctly feel a mass in the left round ligament. Everything held solidly. On opening the abdomen, found the trouble, as expected, on the left side. Omental adhesions were present but the main trouble was found at the left horn of the uterus and here the sigmoid was firmly adherent. Appendages on the right side normal. A panhysterectomy was made but the right tube and ovary saved. In operating, went

down on the right side, across, and then up, thus enucleating the entire mass. Examination of the specimen showed multiple abscesses in the left horn and along that side of the uterus, most of them about the size of the tip of the little finger.

Prompt recovery.

52. R. 19-734.—Mrs. C. W., aged forty-eight. One child, aged six weeks. Patient was delivered normally, but it was known that she had a small fibroid at the fundus. A low type of infection soon developed and when I saw her I found the uterus clearly fixed on the left side with what seemed to be a mass of exudate in the left broad ligament and here there was marked tenderness. She was carefully watched for several days longer, but it was evident that there was much infection present and operation was advised.

Under the anesthetic, vaginal examination showed nothing new. On opening the abdomen, found an abscess on the left side covered over by the sigmoid. Adhesions were separated and pus was found welling up from an abscess at the left horn and along the side of the uterus. An abdominal panhysterectomy was made in the usual way, but in making traction on the fundus it tore off at the cervix but the cervix was immediately caught and removed. Completed the operation in the usual way. Examination of the specimen showed the abscess as previously determined. It was about the size of a hen's egg and apparently had its starting point in a necrotic fibroid.

Convalesced rapidly.

53. R. 20-203.—Mrs. J. A. F., aged twenty-three. One child, aged five weeks. Patient's delivery was normal. The next day she was found to have a rapid pulse and the day after a temperature of 102°. Her physician commenced treating her with serum, but without any effect. Her highest temperature was 105°. Had several chills. Much sweating right along. Lochial discharge reported normal. Examination showed the uterus apparently pulled backward, and back of the cervix was a mass made up, apparently, of the fundus and appendages. No apparent pus in the culdesac. When she was under the anesthetic, could make out an irregular mass off to the left of the uterus, but everything firmly adherent. On opening the abdomen, found the intestines firmly adherent over the uterus. After these were separated, found an abscess involving the left horn of the uterus and other abscesses along the course of the left tube and involving the left ovary. Appendages on the right normal. After separating the adhesions, found pus exuding from the abscess at the left horn and also along the tube. Made a panhysterectomy but saved the appendages on the right. Examination of the specimen showed the abscesses as previously made out. Endometrium clean.

Prompt recovery.

54. D. 20-294.—Mrs. F. L. H., aged twenty-two. Children, two; age of youngest, one week; born normally. Soon after its birth, patient was taken with much vomiting and soreness through the abdomen. No distinct chill, but chilly sensations and a temperature of 103°. Lochia suppressed. Much tympany. Pulse 120. Yellow discoloration of surface. Patient very sick, with a hard, inflammatory pulse. Abdomen much distended and tender all over. Could make out but little through the vagina because of the tympany. Leucocytes 25,000; poly. 86.6 per cent. Patient kept under observation. One week later patient's general condition slightly better but still much tympany. Leucocytes 40,000; 93 per cent poly.; hemoglobin 50 per cent. Vaginal examination shows everything solid in the pelvis, but no evidence of local abscess. A week later, as her condition was getting worse, operation was decided upon. On opening the abdomen, found extensive adhesions. Separating these, an abscess was found in front of the uterus. This contained some thick,

offensive pus and some gas. As there was no evidence of any other abscess being present, drainage was placed at the lower angle of the incision and the rest of the incision closed.

Patient improved somewhat after opening the abscess, but continued to show marked evidence of sepsis and died of exhaustion three weeks later. Probably a hysterectomy would have given a different result.

55. R. 20-434.—Mrs. G. W. M., aged twenty-one. One child, aged two years. Patient had had a miscarriage at three or four months, four months previously; unknown cause. Miscarriage was attended with some febrile disturbance and patient had not been well since that, having more or less fever with pain low down on the left side, occasionally going over to the right. Had been having a good deal of local treatment without any benefit. Vaginal examination showed the os slightly patulous; uterus enlarged, and everything in the pelvis excessively tender. A distinct mass on the left side.

Under an anesthetic could make out the mass previously referred to and, in addition, a mass on the right side and running in front of the fundus. On opening the abdomen, found on the left side the ovary and a distended tube bedded in adhesions. On the right side a loop of small bowel involved with the ovary and tube and in front of the fundus. On separating the adhesions, found an abscess on the left side, containing some cheesy pus. On separating adhesions on the right side, there was an escape of more pus. As the entire fundus of the uterus was denuded, a panhysterectomy was made in the usual way, saving the left ovary and tube. More pus was found under the parietal peritoneum in front. Examination of the specimen showed nothing but what had been previously determined. Smooth endometrium.

Prompt recovery.

56. D. 21-7.—Mrs. R. A., aged thirty-two. Children, two; age of youngest, four months. Patient developed childbed fever three days after the birth. Had chills, fever, sweating, etc. Her labor had apparently been normal and short. She had been in another hospital, where she had been treated for pyelitis. The kidney trouble cleared up but there remained a lump, according to her physician, in the left side, which was thought to represent a retroperitoneal infection. Had been running a temperature from 103° to 105° for several weeks. Has lost a good deal of flesh. Lies with the left leg drawn up on the abdomen. Any attempt at extending the leg gave her much pain. Vaginal examination showed the uterus itself to be in fair shape, apparently, but off to the left was a tender mass probably representing an abscess; 18,800 leucocytes, 77 per cent poly.; hemoglobin 55 per cent. Examination of urine showed an enormous number of pus cells; specific gravity 1009; trace of albumin.

Examination under the anesthetic showed that the left horn of the uterus was firmly adherent to the mass previously found. On opening the abdomen, found an abscess at the left horn of the uterus, involving the left ovary and tube. Right ovary and tube normal. They were detached and a panhysterectomy made in the usual way. While cleansing the parts, found a little stream of pus coming from above. Examination showed this to come from an abscess alongside the left psoas muscle. A dressed tube was introduced into this abscess, brought down and into the vagina; a gauze fluff then placed as usual and the sigmoid mobilized so as to cover everything. Examination of the specimen showed the parts as previously determined.

Patient went through the operation quite satisfactorily, but died on the sixteenth day after operation. Her general condition seemed to improve gradually and two days before her death she was unusually bright and cheerful, but on the morning

of her death she was found to be distinctly worse, failed rapidly during the day, and died in the evening.

Postmortem examination showed the pelvis to contain pus, with loops of bowel forming a covering over it. No general peritonitis. The psoas muscle was found to have been practically destroyed in the abscess formation which had extended from end to end. The pathologist thought it was the presence of this secondary abscess which was responsible for the fatal termination. Possibly an incision into the loin, as in Case No. 34, would have been better.

57. D. 21-123.—Mrs. J. D., aged twenty-two. Children, three; youngest, two weeks. Patient's confinement had been normal, but there had been some difficulty in removing the placenta. She was taken very soon with chills, fever, and sweating. Had been very sick. Examination showed very marked tenderness over the lower abdomen, with a distinct mass extending above the pubes. Pelvis well filled with this tender mass which seemed to be made up of multiple abscesses. Leucocytes 16,920; poly. 83.5 per cent; hemoglobin 67 per cent.

Under the anesthetic found nothing new, but there seemed to be more infection on the right side of the uterus than elsewhere. The uterus itself had undergone very little involution. On opening the abdomen, found a distinct abscess in the wall of the uterus on the left side but that tube and ovary in pretty good shape. The right tube and ovary were greatly swollen, and a mass extended up along the ovarian veins about the diameter of one's thumb. Made the usual panhysterectomy, except that the appendages on the left were saved. Examination of the specimen showed the uterus to be very thick-walled, the walls being very edematous. An abscess in the left side, as previously determined, and small abscesses scattered extensively through the right side.

For several days after the operation, her condition was quite promising. At no time was there any abdominal involvement. Pulse had been rapid from the start and with a little elevation of temperature. After about five days, evidences of multiple pulmonary abscesses appeared and she died with a terminal temperature of 105°.

58. D. 21-326.—Mrs. S. P. L., aged forty. Children, three; age of youngest, four years. Patient had miscarried at six months, seven weeks previously. The pregnancy was evidently molar, the mass being about the size of the fist. Following this, she had chills and fever. Had been getting steadily worse. Highest known temperature 103°. Sweating. Had been vomiting a good deal right along. Some tympany. The physician had found a mass back of the uterus which had persisted and was very tender. Examination showed the patient to be very sick. Tender over the whole abdomen. Uterus up well but firmly fixed by exudate.

Examination under the anesthetic showed nothing new. On incision, found everything in the pelvis a mass of adhesions, with the omentum extensively involved. On separating adhesions from around the uterus, found abscess after abscess which had formed between loops of bowel and the uterus itself. A panhysterectomy was finally accomplished. In separating adhesions of loops of bowel afterwards, to overcome what seemed to be a partial intestinal obstruction, another small abscess was found outside the original field of infection. Examination of the uterus showed it to be of about normal size, with smooth endometrium, denuded of peritoneum, walls fibrous, but no abscess in the walls.

Although patient went through the operation satisfactorily, she almost immediately developed a rising temperature and pulse rate. In the evening her temperature was 103.4°. The next morning the pulse and temperature had dropped down a little, but her general condition was no better. Had been vomiting some, which was relieved by lavage. There was no change in her condition, but with increasing weakness she quietly passed away in the evening.

59. D. 22- * * *.—Mrs. C. U., aged thirty-seven. Number of children, five; age of youngest, one year. Patient had a miscarriage at three months, two weeks before, induced by catheter. Saw no physician for several days, then commenced having chills. The doctor found a bad odor to her discharge, but that cleared up after a day or two under douches. Continued to have several chills daily. Temperature from normal to 104.6°. Nausea and vomiting. Profuse sweating. Examination showed the patient to be a very large woman, with thick abdominal walls. marked tenderness low down on the right side. Vaginal examination showed the cervix patulous. Uterus enlarged. To the right of the cervix, high up, could make out a tender mass running across, about the size of one's finger. Good pulse and regular, but a few hours before she had had a sinking spell in which her pulse became almost imperceptible and the second sound of the heart had disappeared. Advised that patient be brought to the hospital for blood examination and careful watching, with operation later if necessary. The next day, on entering the hospital, she was found to have hemoglobin 67 per cent; leukocytes 55,600; poly. 86 per cent. Patient was carefully watched, with repeated blood counts, but there was continuously a high leucocytosis. As she was steadily failing, with a continuation of her chills and fever, an operation was advised as the only hope and was performed three days later.

The operation was technically very difficult because of the amount of adipose tissue present. On opening the abdomen, found the cord previously referred to running across and up the right ovarian vein, the mass being about the size of a large thumb and extending up indefinitely. Right ovary and tube edematous. Right round ligament infiltrated with pus. On cutting down on that side, found numerous small pockets filled with thick pus. The appendages on the left side seemed normal. Panhysterectomy made in the usual way. As closure of the abdomen was begun, the anesthetist reported that the pulse had disappeared. The ether was stopped and the closure rapidly completed. By that time the patient was breathing well and the pulse was of fair volume. Examination of the specimen showed the uterus enlarged, its interior clean, but the right side was a brawny mass of inflammatory exudate; the ovary and tube as previously described. Many points of infiltration of pus.

Patient came out of the anesthetic in good shape and at 10:40 P.M. was in good condition. Later in the night, symptoms of cardiac thrombosis appeared, with rapid breathing, air-hunger, etc., and patient passed away at 5:00 A.M.

60. R. 22- * * *.—Mrs. W. F. G., aged twenty-nine. Children, four; age of youngest, thirty-six hours. Patient was seen with her physician thirty-six hours after an unusually easy and normal labor. The head was distending the vulva when the doctor first reached her and the afterbirth came away normally. Fifteen hours later she had a slight chill, with a temperature of 101°. Two or three hours later temperature 103.6°. A great deal of pain in the uterus, supposed to be after-pains. Just before her bedside was reached, she had passed a clot the size of the little finger and was feeling better. Temperature had dropped to 101°. Examination showed no tenderness over the abdomen. Uterus well contracted. The presumption was that the whole trouble would disappear since the expulsion of the clot. The next day her condition was worse, with higher temperature, and she was later sent to the hospital for more careful observation and hot antiseptic douches. After reaching the hospital, she was found to have a continuous fever but with fluctuations. Became sore over the entire abdomen. Leucocytes 16,000; poly. 88 per cent. Vaginal examination after forty-eight hours showed the uterus to be quite fixed and to the left of the cervix was a hard mass running out into the broad ligament, with a less pronounced but somewhat similar mass on the right side. Blood

examination next morning showed about the same as at the first. Patient's condition grew markedly worse with more evidence of infection, and operation was advised two days later.

Under the anesthetic, vaginal examination showed more involvement on the right side than on the left. On opening the abdomen, the right ovary and tube were found very edematous. The right broad ligament was edematous. On the left side the appendages were normal or nearly so. Hysterectomy, with removal of the right appendages, made in the usual way. Infected blood clot found extruding from the ovarian veins on the right. Examination of the specimen showed a clean endometrium. The right wall of the uterus was infected, with many small abscesses. A somewhat similar condition, but less marked, on the left side. No free pus.

Patient made a very satisfactory convalescence and went home in about three weeks. Soon after going home, however, she developed a pulmonary condition indicating infarcts, so that she was quite sick for several days, but recovered completely in due time.

61. R. 22- * * *.—S. K., aged sixteen. Patient miscarried of a five months' pregnancy. Preceding the miscarriage for a number of days there was ample evidence of pelvic infection. Following her miscarriage, the pelvic conditions grew rapidly worse, with much pain and the appearance of a mass back of the cervix and extending to the left. A high leucocytosis. Hot douches and absolute rest afforded no relief. Operation was made ten days after the miscarriage.

Examination under the anesthetic showed everything in the pelvis firmly fixed, with what seemed to be a solid exudate. On opening the abdomen, found extensive adhesions imbedding everything in the pelvis. Lines of cleavage were found, the adhesions separated and the denuded fundus finally exposed. In separating adhesions posteriorly, a small abscess was found in the exudate in the back of the uterus and on separating the adhesions further, a tubo-ovarian abscess was found on the left side. The right ovary and tube, although denuded of peritoneum, seemed to be in fair shape. Uterus and appendages on the left were removed. Examination of the specimen showed no additional pathology.

Convalescence rapid.

62. R. 22- * * *.—Mrs. C. L., aged seventeen. One child, aged six weeks; normal labor. Patient had a chill the next day followed by fever. The symptoms somewhat subsided, and she was up on the tenth day, but not well since then. Has had repeated attacks of trouble in the pelvis. Particularly sick for one week past. Repeated chilly sensations with fever; sweating. Examination showed a retroverted uterus with great tenderness on each side high up, but particularly on the right, and at this point there was marked tenderness on deep pressure. At operation an abscess was found in the right horn of the uterus burrowing downward between the muscles. Both tubes full of pus. The right horn of the uterus was resected, and both tubes and the right ovary removed, together with the appendix. Incision closed without drainage. Prompt recovery.

63. R. 12-75.—Mrs. H. C. B., aged thirty-four; married five years; had miscarried at six months about one week previous to my seeing her, discharging a rotten mass of hydatids. Her convalescence for several days was somewhat stormy, but then became worse and she was brought to the hospital. She had been having more or less febrile disturbance right along, the highest temperature being 104. Some chills. and sweating. Examination showed a mass back of the cervix pretty well filling the pelvis. Everything fixed and very tender. Patient septic. The operation the next day showed the mass back of the cervix to be larger than it had apparently been the day before, but it did not seem to contain free pus. Thinking there might be some

hydatids remaining, a dull curet was used, but with negative results. On section, extensive adhesions were found particularly on the left, and these being separated, exit was given to quite an amount of thick and offensive pus. The abscess was found to involve the region of the left ovary and to extend down along the left side of the uterus. Much infiltration. The pus as it exuded was wiped away, and then the left tube and ovary removed. On the right side everything seemed to be normal. Douglas' culdesac was then opened and a gauze drain passed down as usual over which arranged the sigmoid and the omentum. Pathologist reported a tubo-ovarian abscess with an acute gangrenous process involving the tube. Patient made an excellent recovery, later became pregnant and was normally delivered.

64. R. 22-xxx.—Mrs. W. H. H., aged 19. One child eight months old. Labor instrumental, but normal lying-in. Had a miscarriage at three months two weeks before; unknown cause. Infection followed. Examination showed everything in the pelvis quite tender, with a mass back of the cervix and to the right. 10720 leucocytes, 72 per cent polys. Was given an anesthetic and examined, but nothing more found. Delay advised. Ten days later the mass back of the uterus was larger, and distinctly extending up along the left side, pushing the uterus over toward the right. Everything very tender. On opening the abdomen found a tuboovarian abscess on the left, rather higher up than usual, and several abscesses in the bottom of the pelvis where the sigmoid had been adherent. Uterus itself very flabby. A panhysterectomy was made with saving of the right ovary and tube. Appendix removed. Prompt recovery.

65. R. 22-xxx.—Mrs. J. H., aged 32, married 12 years; eight children; youngest aged seven weeks. Last labor normal. Chill on the tenth day followed by more or less continuous fever. Nightsweats. Some nausea. For three weeks had pain in the right side and extending down the right leg. A distinct lump developed low down on that side. Examination showed a good vagina and perineum. Uterus subinvoluted. Presumptive diagnosis: retrocecal appendiceal abscess, or infection of right ovarian vein. When under the anesthetic made out a distinct connection between the right horn of the uterus and this mass. Incision just to the right of the median line. Ovaries and tubes normal. Uterus misshapen, suggesting a two-horned uterus with a recent pregnancy in the right horn. Tumor retroperitoneal, pushing up the cecum. Appendix free but swollen. Abscess evidently involving the ovarian vein. Uterus inclined to retroversion. Excised each tube at the horn of the uterus, and implanted the round ligaments so as to bring everything up in good shape. A cofferdam was built, and the abscess opened and drained, giving exit to several ounces of thick, yellow, odorless pus. A stab incision was made well over to the right, and a dressed tube brought out for drainage. Removed the appendix. Prompt convalescence.

66. R. 23-xxx.—Mrs. D. R., aged 19; one child aged 12 days. Labor natural in every respect. Two days after the birth of the child patient developed fever, reaching 104°. Had one chill. Some sweating. Good deal of tympany, no vomiting. Examination showed a rather healthy looking woman, but evidently very sick. Temperature 104°. A distinct mass low down on the right side clearly connected with the uterus but extending upward. Very tender. Two days later, when under an anesthetic, the uterus itself found in pretty good position, but a mass clearly containing pus off to the right, and high up. Made an incision directly over this mass about as for an appendiceal abscess. Found that the abscess involved the right ovarian vein. Ovary and tube much swollen. Detached the tube and ovary from the uterus and exposed the vein which was tied high up above the point of infection. Appendix removed on general principles. Made a stab in-

cision well over to the right through which passed the ligatures left long, and a cigaret drain, as in an ordinary appendiceal abscess. Uterus, left ovary and tube normal. Examination of the specimen showed it to be largely necrotic with multiple abscesses in the tissues. Prompt recovery.

(During the week following the operation on this patient I saw in consultation another patient in whom I made the diagnosis of infected thrombophlebitis of the left ovarian vein, following a miscarriage two weeks before. Pulmonary complications, attributed to infarcts, were present and the patient was moribund. Autopsy a few hours later verified the diagnosis, and indicated clearly that an operation made before the pulmonary involvement would quite certainly have resulted in recovery.)

67. R. 23-xxx.—Mrs. B. J., aged 27. Children, two; age of youngest three weeks; born normally. She seemed to be all right for a week after the child was born; then the lochia stopped, and this was followed by chills, sweating, and a temperature of 103½°. No vomiting. No headache. Patient looked profoundly septic. Some tenderness through the abdomen but not marked. Vaginal examination showed a greatly relaxed vagina, with some old laceration of the cervix. Uterus fixed by adhesions. Under the anesthetic was able to make out high up on the right side a distinct mass running off from the right horn of the uterus toward the side of the pelvis and backward. On opening the abdomen found on the right side an elongated mass about the diameter of a broom stick, intimately connected with the horn of the uterus. An abdominal panhysterectomy was made, saving the left ovary and tube. The ovarian veins with the surrounding tissues were brought up and cut across directly under the eye. Could see the infected blood clots escaping. Operation completed in the usual way. Examination of the specimen showed a hyperplastic uterus, but could make out no abscess in the wall; merely the infected veins running out into the broad ligament and upward. Prompt recovery.

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A ROUTINE TREATMENT FOR HYPEREMESIS GRAVIDARUM

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THE rapid and continuous progress in surgery is due to the fact that standardized and exact procedures have been developed in the different operations. A gastroenterostomy and a hysterectomy are performed according to a definite technic regardless of any peculiarities of the individual to be operated on.

In obstetrics we still cling to many haphazard methods, antagonizing any attempts at definite procedures or innovations. True, some pioneers are trying to blaze the way.

Median or lateral episiotomy in every primipara, De Lee's prophylactic forceps operation and Potter's version are all aiming at an accurate and definite method for obstetrical deliveries.

Stroganoff and McPherson may be accused of having introduced an almost iron-clad procedure in the treatment of eclampsia. In the most baffling of all our obstetrical complications, hyperemesis gravidarum, we still cling to haphazard methods.

Kosmak in his monograph "The Toxemias of Pregnancy," introduces the treatment with the following statement: "The cardinal fact to be borne in mind is, that no routine method applicable to any or all classes of cases can be recommended but that in each instance, particularly in the severer types, consideration must be given to the individual patient."

In hyperemesis we deal with a serious condition, the true nature of which is still in doubt. Upon our success depends the integrity of a pregnancy and often the life of the patient and we have nothing to guide us even in favored localities except the outcome of two or three chemical tests.

It should seem that, if a definite procedure were tried, the significance and the value of these tests in determining the progress of a case could be readily and accurately determined and in those cases without such advantages, the failure of the treatment itself would indicate that other measures would have to be resorted to.

No doubt the most important addition to our knowledge of the toxemias of pregnancy has been brought about through the investigations of Titus and Givens.

According to these authors, there is a carbohydrate deficiency in the maternal organism due to the unusual demand of the growing fetus for carbohydrates. If the diet of the mother does not supply

this need, then the reserve store of glycogen in the liver is drawn upon, resulting in pathologic changes in the liver.

If the destruction has not gone too far, then the administration of glucose will regenerate the damaged liver cells and aid the liver in its fight against the toxins of pregnancy.

If fatty degeneration has taken place to any great extent, then the glucose cannot be absorbed and stored and an extreme degree of toxicity exists.

Based upon these facts Titus and Givens devised a blood sugar test by which the gravity of the toxemia may be determined.

A definite amount of glucose solution is introduced into a vein, taking thirty minutes for the introduction, a sample of blood having been taken previously. A second sample of blood is taken five minutes after the glucose has been introduced, the third sample thirty minutes later, the fourth and fifth samples respectively, one and two hours later than No. 3.

They claim that a liver depleted of glycogen, but not infiltrated with fat, should be greedy for sugar and should take it up from the blood stream faster than under ordinary circumstances, while a liver with fatty infiltration and necrosis, would have its function in that respect impaired.

The test therefore depends upon the determination of the blood sugar in the five specimens taken. No. 1 represents the patient's condition before treatment, No. 2 shows the peak of sugar after the injection of the glucose and No. 3 shows the sugar reduction in thirty minutes. Bloods 4 and 5 show whether the condition has returned to No. 1 after this interval.

The test surely indicates the power of the liver to store glycogen, and a low sugar absorption, after the injection, may be held as a sign of extensive liver destruction and as a positive indication for interfering with the pregnancy.

The test is a very elaborate one and where such extensive laboratory facilities are at hand should prove of great value in the conduct of toxemias.

The ammonia-nitrogen content of the urine as advocated by Williams, is not generally accepted as a definite indication of the degree of toxemia.

Williams claims that a high ammonia coefficient shows a profound perversion of metabolism and the percentage of ammonia nitrogen above the normal 5 per cent is an indication of the degree of toxemia.

If the normal pregnant woman has 4 or 5 per cent and the early toxemias show from 20 to 25 per cent, it would seem that a gradual decrease in this coefficient towards normal would be a decided factor in indicating an improved condition. Then again an increase of 10

per cent or more of total nitrogen would be an indication for interfering with the pregnancy.

If generally accepted, it would be necessary to have the test made at least once a day for comparison and perhaps at times an examination of a twenty-four hour specimen would be needed.

Besides, the test is not so simple that it would be generally available. Those not accepting the test claim that the high ammonia coefficient is simply a manifestation of acidosis and the acidosis in hyperemesis is ascribed to the accompanying starvation.

We are in the same position if we depend upon the amount of acetone and diacetic acid found in the urine, for those ingredients are the direct results of the starvation.

If we wait for such extreme signs as rapid pulse, elevation of temperature, jaundiced conjunctivae and coffee ground vomit, then interference with the pregnancy will generally be followed by the death of the patient.

Consequently until the cause of the toxemia is definitely known and until we have a specific therapy, the question finally resolves itself into nourishing the patient in such a manner as to give the stomach a complete rest, until the vomiting stops and the toxemia subsides or the patient is carried beyond the time when the toxemia in many instances would seem to be at an end.

It is claimed that in early pregnancy the entire metabolism is performed by the liver of the patient but when the liver of the fetus is fully developed that organ relieves the maternal organism of a good deal of its work and toxemia due to imperfect functioning of the maternal liver ends.

Hyperemesis generally shows itself in the first three months of pregnancy. The liver of the fetus by the end of the third month is large enough to fill almost the entire abdominal cavity and it may be assumed that even before this it enters upon its function and in so far lessens the strain upon the maternal liver.

This would explain the cessation of vomiting after a definite time in apparently hopeless cases, especially in such in which for religious reasons interference with the pregnancy was not tolerated.

A careful method therefore should be followed in the conduct of these cases so that improvement may be expected after a certain time or the reverse be accepted as a definite indication for interrupting the pregnancy.

The following routine has been followed more or less in twenty-four cases in the last two years, with uniform success in twenty-two cases that were under complete control. In two cases in which the writer was only called in as an occasional consultant, death of the mother followed interruption of the pregnancy in one instance, while

the other died from the profound toxemia when the consultation showed that nothing could be gained by so late an interference with the pregnancy.

It is of great importance in instituting the routine treatment that the husband and the family be impressed with the fact that a very serious situation confronts them and that the successful outcome of the condition, even the life of the patient, depends upon their absolute cooperation.

The condition is serious enough to demand hospital conveniences if they are at all accessible and a special nurse in complete charge of the patient. If the case has to be conducted in a home, then hospital conditions should be simulated as much as possible.

At any rate the sick room should not be in close proximity to the kitchen as occurred in one of my consultation cases.

The room should be flooded with sunshine and fresh air, the patient's face being shaded or smoked glasses worn to protect her from any glare. This is considered better than the gloomy darkened room suggested in most instances.

The family and husband must be absolutely excluded. This applies especially to the husband whose presence at once arouses the sex instinct in the patient and reflexly causes emesis.

All administration of food and even water by the mouth should be stopped at once.

The daily routine is begun at 7 A.M. by irrigating the large bowel with a gallon of warm solution containing two rounded tablespoonfuls of sodium bicarbonate. The solution is introduced slowly through a No. 20 catheter and when the patient strains she is allowed to expel the solution along side the catheter. More solution is allowed to run in and the catheter is withdrawn when the final pint has been introduced in hopes that the patient will retain and absorb a considerable part of it, thus supplying that amount of fluid to the system and the sodium bicarbonate combating some of the acidosis.

A catheter with the opening at the side of the tip is preferred, because it is less apt to become occluded with fecal matter than the rectal tube, which has the opening at the end.

At 8 and 12 A.M. and 4 and 8 P.M. 250 c.c. of the feeding solution are slowly introduced into the rectum through a No. 12 catheter with a glass funnel attached, the patient lying in the left lateral position with the hips elevated and retaining that position for a half hour after the introduction of the fluid.

The feeding solution warmed to body temperature before each introduction is composed of 50 grams of glucose, 100 c.c. of trophonine or panopepton, 20 grams of sodium bicarbonate and enough water to make 1000 c.c., this amount being sufficient for one day.

Sixty grains of bromide of sodium are added to each dose of the feeding solution just before introduction and if the patient is restless 30 grains of chloral in addition are dissolved in the 8 P.M. feeding. As the patient improves the amount of sodium bromide may be reduced gradually.

From the beginning an ampoule of corpus luteum extract should be given once or twice daily intramuscularly or intravenously as is advocated of late until erythema indicates that sufficient has been given.

J. C. Hirst and others report remarkable results with this remedy. They do not, however, report in detail what accessory measures are used in the conduct of their cases. It is inconceivable that extreme cases of vomiting would respond solely to the introduction of a few ampoules of corpus luteum.

Accordingly, while the writer has never seen any direct results following the use of this remedy, still he feels it proper to continue with it until its place in the therapy is definitely settled.

After three days of this regime the treatment is supplemented by the introduction of 500 c.c. of sterile 10 per cent glucose solution intravenously. The glucose not only relieves the carbohydrate deficiency caused by the demands of the fetus upon the mother and lack of it in the diet that she has been able to take but it will be absorbed directly by the liver and will aid in regenerating the damaged liver cells if the destruction has not gone too far.

The solution as is well known must be carefully filtered and sterilized and introduced into the vein slowly at body temperature. At least one-half hour being given for the introduction of 500 c.c.

In consequence of a reported fatality from coma following the intravenous introduction of glucose solution in a diabetic, it will be wise in all cases of hyperemesis not to use the glucose if the urine responds to the test for sugar.

The rectal treatments are continued for the succeeding days and on the sixth day a second glucose injection is given intravenously. Continuing the rectal treatments, gastric lavage is practiced on the eighth day with a half gallon of sodium bicarbonate solution containing a rounded tablespoonful of the soda, and a half pint of the solution is poured into the stomach through the tube at the end of the lavage. This is generally retained.

Administration of food is then begun tentatively on the ninth day, the patient being given a Holland rusk or shredded wheat biscuit twice a day.

The cereals are slowly added in the succeeding days, the rectal feedings being gradually reduced in number as the patient is able to retain food by the mouth.

This routine embodies well recognized measures in the treatment of hyperemesis and should form the main basis for the treatment of each case. Additional measures may be used in conjunction with it if considered necessary.

Adrenalin solution advocated by some writers may supplement or take the place of the corpus luteum solution or the latest innovation, feeding by the duodenal tube as advocated by Paddock, may be added to the treatment.

If the patient vomits in spite of the rigid regime to which she has been subjected, then it may be assumed that every reasonable means has been exhausted to correct the condition and the physician may conscientiously interrupt the pregnancy with the knowledge that the patient is in a fairly good condition to pass through the ordeal.

If laboratory facilities are at hand and daily tests for the ammonia coefficient can be made, it should surely be possible to make a very satisfactory prognosis from the results taken from such carefully conducted cases.

The blood sugar tests if available would be of still greater importance as they should quickly determine whether in the given toxemia we are dealing with a liver that can rehabilitate itself or one in which destruction has gone so far that it would be no longer safe to defer interruption of the pregnancy.

Individualization is not indicated in these cases, because all suffer from the effects of starvation, plus a certain amount of toxemia.

With the stomach out of commission, the modern methods of nutrition included in the routine are available and of these the intravenous glucose may be conceded to be the most efficient and definite to combat the carbohydrate deficiency.

With the acidosis due to the starvation more or less eliminated, the efficiency of the various chemical tests to determine the degree of toxemia is greatly enhanced, and it should be possible then to determine definitely whether a pregnancy can be safely continued.

If many of these cases are conceded to be neurotic, then the hypnotic effect of the continuous therapeutic measures should go far to effect a cure.

In malingerers who are simulating nausea to induce the physician to relieve them of an unwelcome pregnancy, the persistence with which treatment is continued and the result of the chemical tests, if available, should soon convince them that their attempt is futile.

It should be extremely rare then that a pregnancy must be interrupted for this condition.

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DISCUSSION

DR. MAGNUS A. TATE, Cincinnati, Ohio.—I know of no more distressing disease to treat than the excessive vomiting of pregnancy. In the first place, we do not know the cause. In the second, we treat it symptomatically, and in the third place, we do not know when to bring on labor. We have tried bicarbonate of soda, glucose, sodium bromid, ingluvin, oxalate of cerium, etc., and we have tried corpus luteum, but the latter in my hands has been disappointing. I have even given morphine, and according to Potter, have had patients chew gum. Every case is an individual one, and we must do the best we can, usually treating them symptomatically. If we encounter a neurotic and are sure of diagnosis, we are reasonably certain we can cure such a case.

The grave and great question, however, is when to interrupt pregnancy. I am free to confess, after seeing a good many cases, I do not know with any degree of certainty. If we have a case with high temperature and rapid pulse, and patient is getting worse daily, we interrupt pregnancy, but the time that we are to do this, is the uncertain factor.

DR. HERMAN E. HAYD, of Buffalo, New York.—I was called in consultation a few weeks ago and had a very unfortunate experience. This woman had three children previously; she had suffered a great deal from nausea and vomiting with all of them, but finally the symptoms subsided and she was safely delivered. When I saw her she had a temperature of only 99.5° by rectum; a few days before it had been 100; pulse 118. I was satisfied the thing to do was to empty the uterus. The woman vomited practically continuously for at least three months that she was pregnant. We had her removed to the Deaconess Hospital, and we gave her a little ether and I did a hysterotomy in a very few minutes with very little bleeding and introduced my finger and emptied the uterus. She bore the operation very well and when put to bed she quickly developed a rapid pulse, 140, and she died in four hours. This is a situation I would not have believed possible, namely, that a woman could be in such a serious condition with no temperature and pulse of only 118. Her blood pressure was low, and she was quite jaundiced.

DR. GEORGE W. KOSMAK, New York City.—I feel complimented that Dr. Speidel has read my book and has referred to my statement that these cases must be individualized. I still feel that is the proper way to handle them, and I do not consider that Dr. Speidel has really advanced a new treatment in what he has presented, because in his recommendation he simply meets some of the underlying conditions that are present in almost all cases of hyperemesis. These women need more than anything else a supply of fluid. I am speaking of the average case, and whether you mix the fluid with bicarbonate of soda, glucose, or something else seems to be immaterial. Having met this indication, I think the remainder of the symptoms must be treated individually, and we must study each patient and do the best we can for her.

I have seen in recent years an increasing number of cases in which hemorrhages have occurred. These hemorrhages have come either from the mucous membranes of the stomach and intestines, or they have arisen in the uterus. I believe that the occurrence of hemorrhages from either of these sources should be accepted as an indication for emptying the uterus, no matter how favorable we may think the result of our treatment is. I do not consider it well to wait for the appearance of jaundice or the extreme emaciation that we sometimes see in cases in which attempts at mouth feeding have been kept up. I feel that the logical thing is to recommend emptying of the uterus in any case in which the vomitus assumes a coffee-ground character or in which blood is noted as having passed by the rectum, or in which there is bleeding from the uterus. A case of that kind came to my attention recently in a

young girl, who was anxious to have a baby, and who had been vomiting for four weeks. She came to the hospital and within a few days the vomiting practically ceased with the methods that Dr. Speidel has outlined. But she continued to bleed from the uterus. Now, whether she was undergoing abortion for mechanical reasons; whether the continued vomiting was inducing that abortion, or whether we were dealing with some other cause I am not able to say. That girl was steadily losing blood. I made a careful speculum examination and found the cervix was considerably eroded; it was patent; I could almost introduce my finger, and I decided to empty the uterus. A gauze pack was introduced to soften the cervix more, and a blood clot of considerable size presented within the cervix. The next day the uterus was readily emptied. The sac was intact, and the fetus was apparently perfect, but I found a considerable amount of ecchymosis around the placenta. The placental separation was evidently due to a toxic cause. I do not believe even the cessation of vomiting would have carried out that pregnancy; I believe she would have aborted, or the fetus would have been malnourished to such an extent that it would have perished.

As I have said, these cases must be individualized, and the treatment which Dr. Speidel has very graphically outlined should be pursued; but aside from that other symptoms must be watched for, and above all, pregnancy interrupted when, notwithstanding the improvement in the vomiting, there is other evidence to show the patient is not doing well.

DR. JAMES F. BALDWIN, Columbus, Ohio.—Dr. J. D. Dunham a local internist, puts the patients to bed and keeps them as quiet as possible under absolute rest. His treatment consists in feeding them small quantities of dry food with no liquids to wash it down. This food adheres to the walls of the stomach as would a dose of dry calomel. I have not had occasion in a single instance to empty the uterus where this line of treatment has been carried out.

About a year ago I emptied the uterus of a physician's daughter who was near death's door when brought to the hospital. Two leading obstetricians saw her in consultation and both advised that the uterus should be emptied at once. She had been vomiting continuously since the beginning of her pregnancy. Both the specialists thought it was too late and that she would die in spite of treatment, but she finally pulled through and is now well. If she becomes pregnant again I shall certainly advise the dry food hoping that an abortion may be obviated.

DR. JOHN OSBORN POLAK, Brooklyn, New York.—It has been generally admitted that whatever the cause of the toxemia is, the burden of it is thrown upon the liver, and we have hoped that routine blood chemistry would show us something about when to empty these uteri, because if the case is carried too long, whether the uterus is emptied or not, the pathology that has taken place in the central lobules of the liver is so destructive that sometimes it cannot be regenerated and death occurs.

Blood chemistry with us has been rather disappointing. The only thing that has come out of the study of blood chemistry has been the creatinine content, and the rise of that is an index as to the prognosis in these cases. That has kept pace as none of the other signs in the blood have done, with the clinical picture of the case. Where the creatinine content has risen and persistently so, notwithstanding the introduction of glucose into the vein and feeding, we have found that these patients become pregressively worse clinically as well as chemically.

There is one other point I want to bring out, and that is a suggestion made some time ago for direct blood transfusion of 300 c.c. in these cases, and I want to say that we have had three recoveries in what I considered absolutely hopeless cases from the clinical picture and the blood chemistry.

DR. H. WELLINGTON YATES, Detroit, Michigan.—I believe with Dr. Kosmak that there are definite instances in which the uterus must be emptied, and probably the creatinine estimation spoken of by the preceding speaker is a fair indication. I am sure also that the blood findings, as studied up to the present time, have taught us very little. We have found the urea content and the other blood findings the same after the uterus has been emptied as before in individual cases, so that in itself it is not an indication of whether we should or should not empty the uterus.

The point Dr. Kosmak has made is one of paramount importance, namely, it is a question entirely of dehydration. It is not a question of starvation except for fluids and if that fluid can be given in some way other than by mouth it should be done. To that end I believe it is highly important that all these cases, especially the grave ones, be hospitalized and absolutely under control.

Physiological chemists have recently brought out the fact that we have been using the word acidosis in a rather loose way, and that some of the cases we have attributed to acidosis have been really due to overalkalinity of the blood.

DR. WILLIAM M. BROWN, Rochester, New York.—I used to be rather optimistic about these cases until I lost a few of them, and now I am afraid of every one of them. I cannot say that I have had quite such a convincing observation as Dr. Polak has reported in regard to the creatinine content. I have seen a number of cases where the creatinine has increased very materially, and the patient would turn around, have a therapeutic abortion, and get well.

DR. JAMES K. QUIGLEY, Rochester, New York.—I feel that until we have some test of the hepatic function we are thrown back on clinical evidence absolutely. I have given up glucose intravenously for the particular reason that it has been disappointing. And I am afraid of the reaction from glucose. I would lay emphasis on the use of bromids *per rectum* and water given intravenously. Van Slyke has called attention to the danger in the use of morphia in cases of acidosis on account of its general effect on respiration.

DR. ABRAHAM J. RONGY, New York City.—Regarding the creatinine content, it is important to differentiate between the patients who are nephritic and those who have no kidney involvement. If the creatinine content is on the increase in patients who are suffering from nephritis, it is not so dangerous as it is in those patients whose kidneys functionate properly.

It is impossible to generalize and put forth general rules to guide us in the treatment of the toxemias of pregnancy. However, any woman who has lost one-sixth of her weight as a result of vomiting of pregnancy is in danger. The loss of weight occurring in the early toxemia of pregnancy must be combated by solid foods in addition to the fluids the patients take. It is a mistake to restrict them to light foods and fluids only; in some instances these patients stand solid food better than fluids, and, really, the patient should be asked as to her preference for any particular kind of food and she should be given any food she desires.

The lower blood pressure is due to exhaustion. Low blood pressure always means a sluggish capillary circulation. The administration of digitalis and adrenalin very often will tend to raise the blood pressure and improve the general condition. Lutein extract, in my hands, did not benefit patients who suffered from pernicious vomiting of pregnancy, and I practically gave up its use in these cases.

DR. SPEIDEL (closing.)—My contention is that vomiting of pregnancy should receive more consideration in order that we may be called in consultation earlier. The cases manifesting extreme symptoms are generally the ones we see in consultation. We get these cases when they are so extreme that to interrupt pregnancy at that time means almost certain death; consequently in these extreme cases, as we

have no positive way to determine whether pregnancy should be interrupted or not, we must at least relieve the patient in such a way that at the end of a definite time, if the disease has not been ameliorated, we should have her in a better condition for interruption of pregnancy than when we first saw her. It would seem that the glucose absorption test of Titus and Gibbons shows definitely whether the liver is able to reestablish itself or not. They have made postmortem examinations of cases of hyperemesis, and the liver in one case showed distinct regeneration of the liver cells due to the glucose injection. If Polak's suggestion of increase in creatinine is a better test then, where laboratory facilities are at hand it should be used. In many localities such laboratory facilities are not at hand, and in these cases we then have to depend upon definite treatment of some kind.

As Dr. Tate says, we have tried this and we have tried that, but have we tried them definitely and systematically from day to day, for that is the only proper way to test a remedy. You can try glucose today and corpus luteum tomorrow and never arrive at anything. It must be done systematically, and that is why I suggested this routine.

In regard to the use of dry food, I have always insisted upon the fact that when a patient is able to take food after the emesis has subsided, it should be dry food, such as shredded wheat biscuits, that must be chewed without the addition of water. Blood transfusion can be added to the suggestions that I have made. The routine is suggested merely as a basis. Irrigations of and instillations into the rectum and the introduction of glucose intravenously constitute the main features to carry the patient along for a short time, hoping that the condition may subside and the pregnancy will not have to be interrupted, or, at any rate, if it is to be interrupted that your patient is in as good, if not a better, condition than she was before treatment was instituted.

FUNCTIONAL DYSTOCIA IN NORMAL PELVES: RECOGNITION AND MANAGEMENT

By James A. Harrar, M.D., New York City

THE recognition and management of functional dystocia may seem a superfluous thesis in these days of short cuts and time-saving obstetrics, but it becomes necessary sometimes to recite one's obstetrical creed just to be sure where one is. In obstetrics as in other branches of surgery there is usually more than one way to achieve a result, and one cannot be too dogmatic in insisting this method is always wrong and that one always right. In this discussion I shall present my personal preferences in treatment but I believe I am speaking for the majority of the staff at the New York Lying-In Hospital. Most of us have worked together so long that given an obstetrical situation the essentials in the management proposed would agree practically 100 per cent.

At the Lying-In, with its large indoor ward service and outdoor tenement service, it has been considered advisable to try out new procedures as they have arisen, limited only by the determination of making and keeping the hospital regarded as the safest place to have a baby. I believe we have extracted the beneficial elements from the employment of the Freiburg Dämmerschlaf, pituitrin, rectal examination, the low two-flap cesarean, median episiotomy and elective version, without completely adopting any of them. All in all, guided by the successive hospital heads, the tendency has been to cling to the old doctrines and straight obstetrics. I might say we have not so much adopted this course as stuck to it.

WHEN TO INTERFERE

I chiefly desire to indicate the routine of procedure in handling tedious labors in normal pelves, that being employed year in and year out has given us the best results.

As it is impossible to define prolonged labor in an individual confinement in units of time it were better to pronounce a labor prolonged or delayed:

1. When there is primary inertia with ruptured membranes.
2. When despite good contractions there is no advance in cervical dilatation or in progress of the presenting part.
3. When there is advance, with increasing malposition.
4. When, due to the above causes, increasing tonic spasm of the uterus develops with continued ascent of Bandl's contraction ring.

5. Lastly and most definitely when the mother or child is showing signs of exhaustion.

Early recognition of organic abnormalities is not so difficult. With careful antepartum examination we can determine rather accurately the size of the bony pelvis, to a certain extent the size of the fetal head, and experience gives us a fair idea of the accommodation of a given head to a given pelvis. The compressibility of the particular head during labor, however, is something we cannot foretell. It is the functional abnormalities of dilatation, propulsion, high retraction of Bandl's ring, plasticity of the fetal head, tolerance of the child to pressure both of head and placental circulation, and increasing malposition that make such cases as I am discussing so treacherous. These abnormalities are ones that only can be appreciated as they develop during labor.

It is good practice for the nurse or attendant to count and record the fetal heart very frequently during active labor, the same as we learned it important to do in our study of scopolamin amnesia. This gives us a valuable chart of the baby's endurance. The first signs of distress on the part of the baby are disclosed by irregularities in the rate and rhythm of the fetal heart and usually before the passage of meconium is observed. Much overlapping of the cranial bones and the development of a very tense caput are also important evidence that the child is being subjected to dangerous pressure.

If labor is delayed, a sufficient number of vaginal examinations must be made to properly supplement the abdominal findings. If there is any question of cesarean section, examination to determine progress may be made by rectum. We prefer, however, routine pelvic examinations to be made vaginally, but limit them to the fewest number possible. The hospital morbidity records are very satisfactory to us in a long series of cases handled with vaginal examinations both indoor and outdoor. Our figures for the past year are 7 per cent morbidity in the wards and 5.7 per cent in the tenement service. The outdoor mortality in 1921 was one maternal death in eighteen hundred confinements, including all cases transferred into the hospital for delivery. We believe the routine vaginal examinations even made as they are by many students and internes, but with proper asepsis of hands and vulva, have been of greater teaching value than those made by rectum. An inexperienced student or interne can do considerable damage to the rectal mucosa. A rectal examination cannot disclose the hot, dry, swollen vagina of prolonged neglected labor, nor can it give a sufficient mental picture of the form or size of the pelvis of the woman perhaps first seen when in labor by the student, interne or consultant. The attendant must know accurately what is going on, and it is only by thorough familiarity with the normal

mechanism that he may realize when things are not progressing as they should. The good old mechanism of labor, the stumblingblock alike of the professor trying to teach it and of the student trying to understand it, must still hold our constant bedside attention at every case. In case the slightest doubt remains as to the position of the head or the capacity of the pelvis, the patient should be put under an anesthetic and a thorough examination made. There are two main problems in prolonged labor: one of dilatation, and one of propulsion, and the solving of these still depends upon the understanding and regulation of the relation of the forces, the passages and the passenger.

HOW TO INTERFERE

If there are hard pains, with rigid cervix in the first stage, the use of morphine-scopolamin is frequently efficacious in controlling the mother's sufferings and preventing her nervous exhaustion while the cervix dilates. A constant observation in the twilight sleep use of scopolamin was the apparent minimum of uterine effort required in effecting smooth and rapid dilatation of the cervix. With membranes intact and dilatation slow, an additional freeing of the membranes for a couple of inches around the os keeps the case under our control much better than their rupture, and should first be given a trial, though in multiparae simple rupture at three to four fingers, with a cervix well effaced, will often be productive of a prompt delivery. As may be observed at cesarean section the membranes are chiefly adherent around the lower uterine zone and the more markedly so the less the cervical dilatation. It has also been recognized by other observers that the physiologic adhesion of the membranes about the cervix when marked does interfere with the mechanism of retraction. When sufficient retraction has resulted in effacement but with dilatation still incomplete and the labor becomes prolonged, insertion of a bag is a most valuable maneuver to prepare the case for delivery. When we have primary inertia with ruptured membranes and cervix only one or two fingers and not effaced, packing of the cervix and upper vagina with gauze is usually of greater value in softening up the cervix and starting good pains than the bag. In this situation the bag does not always work so well. That there are certain limitations in the action of the bags we are forced to admit. Thus there are instances when by intermittent traction on the bag it is finally pulled through without any uterine contractions intervening. In others the presence of the bag excites pains, but as soon as it is pushed through, labor comes to a standstill. A larger bag does the same thing, and a long four to five finger cervix is left on our hands and the baby still undelivered. It is still too early for

forceps and breech extraction after version through such a cervix is exceptionally hazardous even after manual dilatation.

Manual dilatation is only safely effected in a cervix that is pretty well effaced. Even then, except when only a remaining rim needs to be reamed out, there is danger of tearing and hemorrhage. Incidentally, before doing a version one of the most comforting methods I know in surely ascertaining that the cervix is completely dilated flush with the vaginal wall, especially if one's hand is not larger than a seven and a half glove, is to pass an easily sterilized object, such as a china nest egg, in advance of the hand. Then by grasping the egg, the fist can be made as large as is necessary to make it snugly fit the birth canal. As it is slowly withdrawn the resistance of any remaining rim of cervix can be sufficiently abolished to secure the ready passage through it of the aftercoming head.

If delivery is imperative, and the cervix is effaced and three to four fingers dilated but still too rigid to dilate manually without tearing, small snips with scissors on either side after the fashion of Dührssen's lateral incisions are of great value before forceps, and are especially to be thought of when the aftercoming head catches in the cervix. If any extensive enlargement is required or the cervix is not well drawn up, the anterior and posterior vaginal cesarean incisions are safest as further incising is better under the operator's control. In all incisions of the cervix it is well to remember that there is of course a lack of dilatation of the tissues between the incisions, and they are only to be used in definite emergency.

When dilatation of the lower soft tissue funnel, the levator ani margin and the urogenital septum becomes necessary, we are inclined to prefer manual dilatation with plenty of lubricant and repair of such small lacerations as may be superimposed, restricting episiotomy to the cases when danger of a tear into the rectal sphincter is imminent, or when the baby is doing badly and must be instantly delivered. It is a matter of comment in the wards that there is more fever after the repair of episiotomy wounds than those of spontaneous laceration. Whether this is due to house surgeon's technic or to the opening up of less protected planes of tissue to absorption is subject to question.

Coming now to the delivery of the baby in prolonged labor. Close examination for anomalies of the baby's size, attitude and position will sometimes reveal the cause of the delay. Oversize, total or in part, such as hydrocephalus or abdominal ascites; attitudes of deflexion, especially brow, and failure of rotation in posterior position are to be carefully ascertained before attempting delivery. The use of pituitrin by the resident staff is not permitted before the birth of the baby, and is very rarely so employed by any of the attending staff.

It is used rather frequently for postpartum bleeding before the full effect of ergot can take place.

With the head at or above the brim we have always favored version in preference to high forceps and still do. The case histories present 3298 versions as opposed to 814 high forceps, or in the ratio of four to one. Potter of Buffalo had laid emphasis on the combined advantages of a certain group of maneuvers in podalic version and breech extraction. The details are not new, but the combination results in such an excellent delivery as to give the name "Potter Version" to the operation. We are endeavoring to adopt this grouping of maneuvers when we have to do a version and most of us find each step the easier done in the way Potter practices. Even with improved results, however we still adhere to the old indications, and if we are doing a few more versions it is only because we are doing less high and hard median forceps. Version competes with high and hard median forceps, but we are not yet prepared to admit that it competes with low median forceps or in any way with undelayed spontaneous delivery.

Just here to reiterate for emphasis in breech extraction, one should always be prepared to make use of Dührssen's incisions should the head stick in the cervix, and to use forceps on the aftercoming head, also that Potter's practice of deep digital pressure exerted externally just back of the pubic bone is the most advantageous method of applying force to the aftercoming head. Some operators are too prone to forget everything in the excitement of the moment but continual violent traction on the body of the baby.

The most frequent and most commonly unrecognized cause of delayed labor in normal pelves is failure of rotation with persistently posterior position of the occiput. Most occiputs rotate and deliver without giving trouble, only a few become persistent.

In 8,360 recognized posterior occiputs in the Lying-In Hospital, previous to 1907, only 433 or 5 per cent required interference with artificial delivery.

To return to indications for interference, briefly, it is proper to interfere in delay due to a posterior occiput, (1) when despite good contractions there is no advance, or (2) when with advancement there is an increasing extension of the head.

Version with head above midpelvis in such conditions, manual rotation and forceps extraction with the head below midpelvis are the operations of choice. Molding of the head through the brim is no contraindication to version if under complete anesthesia the uterus relaxes with sufficient elasticity to readily admit the passage of the hand and wrist through the retraction ring. In fact a well molded head is much easier to deliver in the breech extraction after version than one that has not molded.

Complete Scanzoni rotation of the posterior occiput with the forceps is a dangerous procedure in most hands. If there is but slight resistance the maneuver is satisfactory and is a beautiful operation. But if at all difficult the leverage is so powerful that the anterior blade frequently cuts into the child's scalp and cheek just in front of the anterior ear and there is risk of high and deep vaginal tears. Under complete anesthesia manual rotation with external assistance is much to be preferred and is usually successful. I have yet to find a head that could not be rotated manually at least to the transverse position, and then by introducing the posterior blade first, the head can be pretty well held from sinking back into its former position while the other blade is applied and locked. Completing the rotation with the blades through one-eighth of a circle is simple and comparatively harmless.

I will not enlarge upon the subject of cesarean section in normal pelves, but there is undoubtedly a definite field here for the operation in oversized babies, in prolapsed cord with long poorly dilated cervix, in nonengagement with tonic uterus and live baby, and in cases of previous stillbirth from dystocia in what had been considered a normal baby and pelvis relationship.

Patience in obstetrics is next to asepsis, but it must be the active patience of close observation; not the passive patience of ignorance, allowing the mother to become totally exhausted or the baby in imminent peril of death before determining on a line of action. In prolonged labor, as thus defined, I believe any operative procedure is justified that will not injure the woman's health or harm the child.

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DISCUSSION

DR. JAMES K. QUIGLEY, Rochester, New York.—Our interns and nurses examine the fetal heart every thirty minutes, and oftener than that in the second stage. I do not agree with the essayist regarding the question of rectal examinations. I will admit it is more difficult to teach the making of a rectal examination. The average intern will get very little in the first month from making a rectal examination but in handling a private case I think it is quite satisfactory. I believe incomplete dilatation of the cervix with the application of forceps is responsible for many dead babies. The statement that episiotomy is followed by a higher morbidity than spontaneous tears is a surprise. It certainly does not sound logical to me that a clean-cut wound will give more temperature than a laceration which is spontaneous. In the occipitoposterior cases I agree with Dr. Harrar that they are the *bête noire* of obstetrics. I use manual rotation, and forceps rotation very seldom. I think manual rotation followed by extraction will work out better in the majority of cases.

DR. ARTHUR H. BILL, Cleveland, Ohio.—There are two points in Dr. Harrar's paper upon which I would like to comment. The first Dr. Quigley took up namely, the question of rectal examination. I heartily agree with what has been said that in teaching students we should give them the experience of making vaginal ex-

aminations, but in my own private practice I find vaginal examinations during labor almost wholly unnecessary. It seems to me, one can detect practically everything he wants to know about his patients during labor by rectal examination. I have pursued the policy of practically eliminating the use of vaginal examinations during the course of labor and I do not make a vaginal examination during labor in one per cent of my patients.

The other point is with regard to the posterior position. To be sure, a large percentage of posterior positions will rotate spontaneously as Dr. Harrar has said. Sometimes these heads will rotate in a few minutes; sometimes they will rotate in a few hours or many hours, but it seems to me wholly unnecessary to allow a patient to go on in labor with its bad effects upon the child in the hope that the head will rotate spontaneously, when the physician can in a very few minutes convert that abnormal position into a perfectly normal position and save the patient all this extra work with its accompanying dangers.

In regard to the Scanzoni procedure, there is nothing dangerous about it; there should be no laceration connected with it and no damage done to the child's head. The trouble with the typical Scanzoni procedure as it is described in the literature is that it is described as a combination of rotation and traction; in other words, a spiral movement is made, as the head is drawn down, and that tears the vaginal wall and makes unnecessary pressure on the head. The ideal way to perform a modified Scanzoni rotation is to rotate the head in the station in which it lies, with absolutely no traction, just as you would do if you inserted the hand. A great advantage in using forceps in this rotation instead of the hand is that you do not displace the head so much as when the hand is inserted. If the technic is perfect, there should be no reason for laceration or any injury to the child during rotation. Laceration occurring during delivery after the head is rotated will also occur if there is a primary anterior presentation. I have followed the modified Scanzoni procedure ever since I have been in practice, and have performed it in hundreds of cases. I have yet to fail to rotate the head by forceps. It is seldom that great force is necessary if no traction is made with the rotation.

DR. EDWARD SPEIDEL, Louisville, Kentucky.—I would like to endorse what Dr. Bill has said in regard to converting a persistent occiput posterior, by a Scanzoni operation, suggesting however using the axis traction forceps in the performance of the operation.

I did not hear the essayist refer to the conduct of breech presentations in the Lying-In Hospital. I should like to say that we have simplified that so much that I will repeat again a statement made last year as to a simple and effective way of delivering breech presentations. When full dilatation and rupture of the bag of waters have been obtained, then under surgical anesthesia iron out the perineum, bring down the legs, and slowly and deliberately, taking plenty of time, deliver the anterior and posterior arm and the head. This will do away with the danger of breech presentations and make it possible for the operator to work without any hindrance on part of the patient. I consider that a great improvement over the old method of breech delivery.

DR. MAGNUS A. TATE, Cincinnati, Ohio.—I was much interested in Dr. Harrar's paper for a number of reasons. One the mortality report, namely, one death in 1800 women. That is a remarkable record to have, from an out-of-door obstetric clinic. I do not know of such a record anywhere else.

I was particularly interested in the strong emphasis he placed upon using the stethoscope so repeatedly for keeping tab on the condition of the child's heart. If we have a child's heart that is beating regularly we do not have to be in a hurry to deliver, but if the heart is becoming feeble or rapid, then action is called for.

I was pleased to hear his remarks with reference to manual rotation. I have practically given up the Scanzoni procedure, and rarely rotate the head with forceps, as I feeel I can do better work manually.

DR. PAUL T. HARPER, ALBANY, NEW YORK.—I want to say a word or two regarding the value of vaginal examination in the class of cases under discussion. I am willing to admit the desirability of making infrequent vaginal examinations, for there is nothing in connection with a vaginal examination that cannot be made out just as well or better in some respects by a rectal examination. However, the vaginal examination serves a purpose that cannot be accomplished in any other way. In fact, the necessity for artificial rupture of membranes is a definite indication for making a vaginal examination.

Rectal examination serves a great and useful purpose, in that it will help to eradicate puerperal infection, but the fact must not be lost sight of that in the absence of spontaneous rupture of the membranes we have a definite indication for vaginal examination. If we impress upon our students too strongly the desirability of making rectal examinations exclusively, we are going to lose sight of the fact that there is a definite indication for carrying out vaginal exploration.

DR. BURLEY LANKFORD, NORFOLK, VIRGINIA.—In this day of universal version and prophylactic forceps, it is hardly necessary to say that a paper of this sort is valuable.

I was glad to hear him use the expression active patience rather than inactive patience. I was also glad to hear him say that we can use a vaginal examination when we think it is necessary. There is no question, as Dr. Bill has pointed out, that if you are familiar with the pelvis before the onset of labor you can use rectal examinations all the way through, and there are few such cases in which it is necessary to make a vaginal examination, but you cannot teach students proper obstetrics unless you let them make vaginal examinations.

DR. HARRAR (closing).—I knew I would arouse some criticism regarding vaginal versus rectal examinations. There is a great bug-a-boo about vaginal examinations. A man who is surgically trained should be able to introduce his fingers into the vagina as safely as into the peritoneal cavity. Our results and our morbidity with vaginal examinations are satisfactory to us. Many of our cases are first seen by us in consultation and cases are admitted as emergencies or handled by students and interns, who have not had the opportunity of the antepartum examination. We think it is necessary for them to make one vaginal examination to determine exactly what is going on, but we limit vaginal examinations to the fewest number possible.

As to manual rotation versus the Scanzoni procedure. Dr. Bill has done a great many that we would not think necessary. In over 8000 recognized posterior occiputs occurring in 41,000 labors, we only had 443 that required interference. Not all of them were forceps cases. If a posterior occiput case is progressing in good flexion, I see no reason for interference, provided the woman does not get tired. If there is increasing extension, or advance ceases, interference is necessary, but it does not happen very often.

DYSTOCIA DUE TO PERSISTENT CONTRACTION OF BANDL'S RING

By John N. Bell, M.D., F.A.C.S., Detroit, Mich.

THIS condition is becoming known, in present day medical literature as "contraction ring dystocia" and is probably identical with the "hourglass contraction" of older writers. It usually occurs in the second stage of labor, the contraction ring forming at the point of least resistance, namely, the curve of the neck, flexure of the extremities, and other nonresisting portions of the child's body. Some authors, notably the French, believe the contraction is confined entirely to circular fibers of the lower portion of the upper uterine segment, while above, and below this point the musculature of the uterus will be found flaccid. Others believe the condition to be nothing more or less than a tetanic rigidity of the whole upper segment, the lower thickened margin forming the so-called contraction ring. The writer is inclined to believe the latter theory correct, as it would hardly seem likely contraction would be confined to a particular group of muscle fibers where such an intimate interlacing exists.

DIAGNOSIS

The diagnosis is usually made where, in difficult labor, the hand is introduced into the uterus in attempts at version, or for the purpose of making a positive diagnosis of the position of the presenting part. In women with thin abdominal walls the contraction ring can sometimes be felt on palpation.

In an excellent article on this subject by White, (*London Lancet*, March, 1913), the cause is attributed to premature rupture of the membranes, intrauterine manipulation, increased irritability of the uterus, or malpresentations. To these may now be added: indiscriminate dosing with pituitary gland extracts.

MORTALITY

In *Surgery, Gynecology and Obstetrics,* (1910), Dr. R. L. Dickinson published an exhaustive paper on contraction ring dystocia and places the maternal and infant mortality at 33⅓ and 50 per cent respectively. This high mortality illustrates the importance of making a diagnosis as early as possible in order to decide upon appropriate measures for terminating the labor successfully.

In the case here reported I am convinced it would have been impossible to deliver the child even after embryotomy.

Mrs. X. Italian, aged forty-four, para x, at full term.

Labor started at 2 A. M. Oct. 14, 1920, her family physician saw her about 3 A. M., and made a vaginal examination and diagnosed face presentation with complete dilation of os.

He administered one ampoule of pituitrin which did not have the desired effect. At 5 A. M. another physician was called to administer the anesthetic and the forceps was applied. After repeated efforts at delivery lasting about one hour, he was unable to succeed.

At 6 A. M. another ampoule of pituitrin was administered but without results. At 8 A.M. the third ampoule of pituitrin was administered. My associate Dr. A. R. Moon, was now called in consultation, and had the patient removed to the hospital and properly prepared. A careful attempt at delivery was made but without success. Dr. Moon then summoned me at 10:30 A.M. The patient was now in a precarious condition, pulse 150, feeble, considerable pulmonary edema, blood-stained, frothy mucus oozing from mouth and nostrils. Digitalis was now administered, the patient etherized and an attempt made to convert the face to occiput presentation. This was found to be impossible because of the tetanic contraction of the upper uterine segment. An effort was then made to do a podalic version, but this too failed, because of the displacement backward of the lower extremities and unusually thick, dense and firmly contracted Bandl's ring found to be encircling the body and one lower extremity of the child.

Fearing that further efforts would prove fatal, the patient was returned to her bed and kept as quiet as possible with small doses of morphine, hoping she might regain sufficient strength to withstand the shock of removal of the child by embryotomy.

She did not react well however and died of pulmonary edema. After twenty-four hours the uterus was removed and the accompanying pictures illustrate the condition found on section.

Just how much the heroic dosing with pituitrin had to do with the development of this condition is a question; it was undoubtedly a very important factor, and this case illustrates the danger incurred in the promiscuous use of this powerful drug.

1149 David Whitney Building.

OBSTETRICO-GYNECOLOGICAL DIAGNOSIS. THREE UNUSUAL CASES

By Adam P. Leighton, Jr., M.D., Portland, Maine

Case 1.—*Hematosalpinx.* Miss K. L., a trained nurse and hospital executive, age twenty-five years. Past history, children's diseases only and in good health up to 1915, when appendectomy was done for acute appendicitis. This was evidently considered a "clean" case for the incision was tightly closed. On the tenth day after operation, a large quantity of pus was discharged through the wound. This so-called "stitch abscess" drained profusely for two to three weeks. Recovery was slow and it was a year before the patient could resume her hospital work. In 1918, she was operated upon again, following symptoms of continuous abdominal pain, with rapid loss of weight. "Adhesions were broken up" according to her statement and the left tube was removed. Good recovery followed with health and weight quickly regained.

On June 12 of this year, she suffered an acute attack of pain in the right abnexal region. No temperature or vomiting. She was confined to her bed for several days, but recovered quickly and resumed her hospital duty. On July 12, just before starting from her home in Worcester, Mass., to spend her vacation at Old Orchard Beach, Maine, she had another attack of pain in the lower right quadrant, much more severe than previous attacks. There was vomiting and extreme distention, but no rise of temperature. Diagnosis was made of intestinal obstruction. By enemata, however, the distention was relieved. Ten days later, having seemingly recovered to such a degree as to allow her to travel, she came to Old Orchard. The next day, July 23, I was called from Portland to see her. The history was given me just as I have related. Her menstruation had been regular and normal. When I saw her, she was suffering acute pain and was extremely sensitive over McBurney's point. There was pallor, abdominal distention and her temperature was 101°, the pulse 110 and respiration 42. I had her immediately removed to my hospital. The white count was 15,000, hemoglobin 50 per cent, urine negative and lungs negative. Blood pressure was 118/74. It certainly had the ear marks of an "acute abdomen" but I decided to temporize. Hot fomentations and enemata with salines gave relief and excellent results, with relief of distention. She was decidedly improved. The next day, July 25, she was comfortable up to the late afternoon, when there was a sudden return of pain, followed by collapse. Temperature 103°, pulse 132 and respiration 44. Laparotomy, with gas-oxygen anesthesia was immediately performed through a median incision. The abdomen was filled with fresh blood and blood clots. I did not think she would live to be taken from the table. The network of adhesions made it extremely difficult to reach the pelvic cavity. The right tube and ovary were removed. Two cigarette drains left. Macroscopic examination of tube showed marked distention due to a large organized blood clot. There was no tubal rupture. The abdominal end of tube was open, with partial extrusion of the blood clot simulating tubal abortion. In the center of the clot was a small amount of foul-smelling pus. Microscopical examination showed an old chronic salpingitis but no sign of decidua or decidual reaction. It was a typical hematosalpinx. There was a copious discharge of pus for three weeks, the wound healing well and the patient making a good recovery.

Here was a case wherein the appendix had been removed and later a secondary

operation was done on account of adhesions which evidently caused obstructive symptoms. I had never seen the girl before and the picture when I first saw her, was anything but one of possible ectopic pregnancy. She was septic. She had an increased white count. Her pain was exquisite over the old appendiceal scar. One would recognize obvious localized peritonitis and possibly consider stercoral ulceration with perforation, ovarian cyst with twisted pedicle and almost anything except to connect her symptoms with any adnexal difficulty. When she went into collapse and showed the extreme pallor and had prostrating pain, I confess I did consider ectopic rupture. All this, however, was with a history of regular menstruation. When the abdomen was opened and the hemorrhage found, the picture was complete. The microscope disclosed a hematosalpinx. I have often seen some free blood in the peritoneal cavity when operating for the removal of an unruptured pregnant tube and of course, when an ovum is near the fimbriated end and the tube is in the way of aborting it into the pelvic cavity, there may be a considerable amount of intrapelvic bleeding and the case simulate tubal rupture. My explanation is, that even at the first attack of pain on June 12, there was considerable hemorrhage from some eroded vessel in or near the fimbriated end of the tube. A primary hematocele was formed. A month later, a fresh hemorrhage took place pushing the blood tumor further up into the abdomen and then came the last and most severe attack of pain, with collapse and exsanguination, due to the same reason, complicated with coincident pelvic and abdominal infection from the pus collection in the tube.

Case No. 2.—*Dermoid cyst simulating pregnancy.* Miss F. B. Age nineteen. Patient presented herself at my office on May 10, of this year. Said she had a "swelling" in her abdomen. Past history: Had influenza in October 1921, followed by empyema with subsequent rib resection. Made a slow recovery. Menstrual history: Onset at thirteen years of age, three to four-day type and rather irregular. Menstruated in October and November. Up to the time of consultation, she had menstruated but once since November, although there was a slight flow in early April. External examination disclosed a symmetrical abdominal tumor, corresponding in size and height to a twenty-eight weeks' pregnancy, rising to about three fingers' breadth above the umbilicus, which had been of slow regular growth, obvious to the patient since February. Attempt at vaginal examination showed an unruptured hymen with digital insertion impossible. There was a well-marked pigmentation of the primary areola and Montgomery's tubercles were present. Colostrum in good amount was easily expressed from both nipples. She said that she had been nauseated most of the time the past six months. Fetal heart was not present. The mass was tense to the touch and resembled hydramnios. She stated that the mass was "sore" and she was "lame" across the abdomen. Her temperature was 101°. She emphatically denied any attempts at sexual intercourse. The picture was one of undoubted pregnancy, however, and I sent her home to her family physician with a diagnosis of intrauterine death of fetus. The growth had been too slow for hydatidiform mole and there was no suggestive vaginal discharge. The physician telephoned me, the next day from a nearby town where the patient lived and confirmed the diagnosis and even assured me that he and the girl's father knew the fellow who was responsible. Her father had been "suspicious" of his actions for some time. A thrashing was administered to the boy by the irate parent. A day or so later, the doctor and the father of the girl arrived at my office, bringing the girl with them, and desired that I make some arrangements for her care at time of confinement. I took her to the hospital for observation with the expectation that labor would soon take place or that the uterus would have to be emptied. Her temperature ranged between 100.6 and 102. The pain

increased in severity. Blood count showed 24,000 white cells on May 21, and on May 25, the count was 31,000. Upon questioning the girl, she confessed to attempts at sexual intercourse and stated that there had been seminal deposition upon the external genitalia. I gave her an anesthetic, ruptured the hymen and made a vaginal examination. The cervix was elongated, conical and normal to the touch and far from the feel of the cervix of pregnancy. I began to waver in my diagnosis. The pelvic brim was well filled with a mass similar to the engagement of the lower uterine segment. No body of a nonpregnant uterus could be felt. The next day, I opened her abdomen with the idea of exploration to ascertain the cause of the intense localized pain in the left lower quadrant. I found a large dermoid cyst of the left ovary. It was everywhere adherent to peritoneal surfaces and the omentum. Incision was made into the tumor and about six quarts of fluid resembling pea soup was drained off. There were two large wads of hair as large as one's two fists and hundreds of little balls of sebaceous material, slightly larger than peas. The tumor was peeled off and removed. Drainage was left for three weeks and she made a good recovery. I have prided myself that I could diagnose pregnancy and have laughed at the mistakes of my colleagues, when in the last half of pregnancy, the diagnosis has been one of tumor. I have also seen infinitely better men than I, open the abdomen on a pregnant uterus when they contemplated removal of an abdominal neoplasm. Here was a girl whose menstrual history, plus the possible opportunity for pregnancy being present, had in addition, deep pigmentation of the areola and a considerable quantity of colostrum in the breast. It looked to me like fetal death in the uterus coupled with a sapremia. I have never seen colostrum present in such an amount, in a case of abdominal or pelvic tumor, unless perhaps the patient had previously borne children.

The inflammatory condition of the dermoid is interesting too, in addition to the complete adhesion of the mass to the abdominal contents. The size of the dermoid is worthy of especial notice.

Case No. 3.—*Eclampsia without usual preeclamptic symptoms.* Mrs. J. C., age 31, primipara. Patient was under my constant observation from beginning of third month of pregnancy. Past history negative except for scarlet fever, at fourteen. Urinary examination was regularly made at two and one-half week intervals. The probable date of confinement was the last week in July of this year. On June 13 I went to her home to make the customary pelvic measurements. Except for an edema of the ankles there were no objective or subjective symptoms worthy of note. Her blood pressure was 118-80. There were no visual disturbances, no headache, epigastric pain or dizziness. The urinary specimen was examined this day and was absolutely normal. Two days later, on June 15, I was called to her home. Edema was not particularly increased but she had a slight headache. Her mental condition was peculiar for she acted silly. Amnesic aphasia was present and rather extreme. Blood pressure 120-80. In the evening I returned to her home taking a nurse with me to watch her and care for her. As I entered the house, I heard a commotion upstairs and the unmistakable respiratory sounds of an eclamptic fit. I found the patient in a severe eclamptic seizure. Administering a half grain of morphine, I called an ambulance and had her taken to my hospital where I immediately performed cesarean section. Her blood pressure just previous to section was 100 systolic and 70 diastolic and catheter specimen of urine showed a heavy trace of albumin. A healthy child was delivered and the patient made an uneventful recovery. The urine was clear and normal in every respect on the third day and she voided large quantities. The

antepartum convulsion was the only one she had. Her mental confusion quickly cleared. She was home on the eighteenth day.

The absence of visual symptoms, the absence of the omnipresent preeclamptic symptom of epigastric pain, the low blood pressure and normal urinary findings, followed by true eclampsia in less than forty hours is rather extraordinary.

I cannot account for the low blood pressure after the eclamptic onset and just previous to the cesarean unless maybe an old myocardial condition was present and the heart muscle overtaxed by the convulsive effort, would be a sufficient explanation.

192 State Street.

DISCUSSION

DR. EDMUND D. CLARK, Indianapolis, Indiana.—I should like to ask Dr. Leighton whether he used the x-ray in making a diagnosis in the second case?

DR. BURNLEY LANKFORD, Norfolk, Virginia.—Did you make a rectal examination to determine the position of the cervix in the second case?

DR. DAVID W. TOVEY, New York City.—Dr. Leighton mentioned the history of normal menses in his case as ruling out ectopic pregnancy. Ectopic pregnancy is easy to diagnose if you have a history of skipped menstruation and the cardinal signs of fainting, etc., but we frequently get a history of normal and regular menstruation in ectopic pregnancy. There is nothing more difficult to diagnose than ectopic gestation in a case where the symptoms are not regular. I do not think the cervix is of any particular use in diagnosing pregnancy. If the uterus is pregnant, you always get a soft elastic area just above the internal os. It is easy to feel by steadying the fundus of the uterus and inserting the fingers in front of the cervix. You must be sure to wait between the contractions, otherwise you get a hard uterus, because during pregnancy the uterus contracts rhythmically. If you put your finger in the vagina you stimulate the uterus to contract, and sometimes you will get a prolonged contraction, and you will get a hard area, but if you wait a few minutes for the contractions to stop, you will get a soft elastic area there. If the fetus is dead the area is so soft, that it is like putting your fingers into putty.

DR. WILLIAM M. BROWN, Rochester, New York.—I should like to ask Dr. Leighton whether he made use of blood chemistry in the third case, and further to get an expression of opinion from some of the members as to the value of blood chemistry in these cases of eclampsia, preeclamptic toxemia, or hyperemesis. The further I go in making observations of this complication of pregnancy the more uncertain I am and the more unable I am to make a prognosis or a diagnosis as to the degree of protein overload in the blood. I have found so many times cases of impending eclampsia coming on without much evidence of increased toxemia, as shown by the blood chemistry, and yet after they have gone through seizures, or after they began to get well the nitrogen retention increases. Our pathologist has come to the conclusion that the blood chemistry lags. Apparently the clinical picture is twenty-four hours ahead of the blood chemistry. The principal picture we have to depend upon is the clinical picture. I have seen a case of eclampsia come on, in labor, that under the most painstaking care and observation did not show the slightest evidence of toxemia.

DR. EDWARD SPEIDEL, Louisville, Kentucky.—I would like to ask the essayist whether he investigated the diet of the patient twenty-four hours preceding the attack of eclampsia. We have many cases in which the final cause seems to be a fat anaphylaxis, as we have cases of eating too much ice cream or of cabbage or greens impregnated with bacon grease as a fulminating cause.

DR. CHARLES L. BONIFIELD, CINCINNATI, OHIO.—With reference to the question of diagnosis of pregnancy in the unmarried, I think those of us who have done a good deal of consultation work have had to decide this question sometimes under very embarrassing circumstances. It seems to me, that before we should pass judgement in such a case as the doctor had, it would be well worth while to give the patient an anesthetic and make an examination that would be enlightening.

DR. LEIGHTON (closing).—As regards the question asked by Dr. Brown (Rochester) about the blood chemistry, I admit that I did no more than to examine the urine.

With regard to the question asked about the use of the x-ray, I did not use it. I have used the x-ray in one case, I remember, as an aid to diagnosis, and it worked out well. In this woman a diagnosis of ovarian tumor had been made and preparations to have it removed. To me her case seemed to be clearly one of pregnancy. The x-ray picture showed a seventh or eighth month pregnancy. The vertebrae could be seen. The x-ray in my experience is of little value until the case is within two months of full term, because you cannot obtain a good picture of the fetal bones before that time. I made no rectal examination in the tumor case.

As to the question of ectopic pregnancy in the first case, I knew some of you would mention this possibility. I possibly was too charitable or too gallant to speak of this case as one of ectopic pregnancy, because the patient was a very charming young lady.

I cannot agree with the statement that the cervix is not a good diagnostic sign in pregnancy. When I ruptured the girl's hymen and found a conical, elongated, hard cervix, I knew it was not one of pregnancy. The cervix is a valuable diagnostic sign in pregnancy.

The question of diet is important. Dr. Hastings-Tweedy, of Dublin, in his article, "The Cause and Cure of Eclampsia," says that food is the actual exciting etiologic factor in eclampsia. I have seen it proved myself. So far as diet in this case was concerned, I do not remember anything to which we could attribute the onset.

CLINICAL ASPECTS OF BLOOD LOSS IN LABOR

By Paul T. Harper, M.D., Albany, N. Y.

MENSTRUATION and parturition are the only physiologic functions attended by blood loss. That occasioned by the former, which is small in amount, serves a definite purpose, and is rarely pathologic; while blood loss met in labor is more abundant, far from purposeful, and, for the latter reason, is often pathologic. In the latter instance bleeding is the inevitable consequence of placental separation, and its pathologic aspects are illustrated by the dangers of intrauterine asphyxia of the child when separation takes place prematurely and, particularly, by the maternal mortality and morbidity attendant upon its occurrence immediately following delivery.

Continuity of the uterine and placental circulations persists until forces active during the third stage of labor separate the placenta and expel it. With separation, patent sinuses distended with blood from innumerable vessels present, and hemorrhage is inevitable unless means are available to prevent it. The latter are at hand, and postpartum hemostasis is as much a part of the work of the puerperal uterus as is dilatation of the cervix or delivery of the child and, with limitations offered by a fairly extensive bleeding area, it is reasonable to presume that the work will be done no less perfectly.

Therefore undesirable blood loss attendant upon labor may be considered as a manifestation of abnormalities in or perversions of physiologic forces that check postpartum hemorrhage and keep it checked. Not only to present it in such a light but also to make it possible to minimize loss in every case and to cure it in others because management is based upon knowledge of why the particular patient bleeds, the following paragraphs are written.

The factors that bring about physiologic hemostasis immediately following termination of the third stage are multiple ligation of the smaller uterine vessels, heightened coagulability of the blood, and slowing of the blood stream.

The inherent property of uterine muscle to contract firmly makes it possible for the principle of compression to be applied to postpartum control of bleeding; and the condition of the uterus immediately after labor makes such compression highly efficient. When the uterus retracts, thickness of its walls increases to the same extent that size of its cavity diminishes; and, although the latter is important in that the interior of the uterus presents less surface from which it can bleed, it is the thickness of the uterine walls that makes it possible

for bleeding to be checked. Hemostasis results not only because the innumerable uterine vessels are bent and twisted as they lie among the tightly packed muscle fibres of the retracted uterus but also because each vessel is "ligated" at several points along its course by the muscle fibres in relation with it. Further, compression is available at once; for the uterus may be expected to maintain the activity that has characterized it since labor began.

In the constricted vessels and particularly in the uterine sinuses, the blood undergoes rapid coagulation, made possible by its increased fibrin ferment content and the formation of multiple thrombi begins. Lowering of blood pressure that follows delivery still further facilitates hemostasis by increasing the tendency of the newly formed thrombi to remain in their places.

How much time is required to establish complete physiologic control of bleeding cannot be stated arbitrarily. Just as certain factors expedite and others retard progress in the second stage, so inherently weak or temporarily exhausted uterine muscle, or impaired coagulability, or even hypertension may interfere with the relatively early establishment of the state wherein further bleeding is not to be expected. However, experience leads to the conviction that at the end of eighteen hours chances of new blood loss are remote. This view is based upon observations that the fundus remains firm, the lochia that follow are less than normally abundant, and involution proceeds rapidly when an intrauterine tampon is removed eighteen hours after its introduction, immediately postpartum, for the control of bleeding due to atony of the uterus.

The foregoing paragraphs are descriptive of what may be termed the physiology of postpartum control of bleeding; and it is as perfect a "mechanism" as is that of any one of the conventional stages of labor. Further, careful analysis of cases almost invariably reveals adequate explanation not only of the bleeding itself but also of the cause. Finally, with causes understood, the mechanism can be kept normal or its untoward manifestations treated efficiently. More to emphasize its clinical importance than merely to add to the already extensive obstetric nomenclature, it is urged that the period beginning with termination of the third stage and ending twelve or eighteen hours later, with more or less complete hemostasis established, be considered labor's "Fourth Stage."

Because it is much more important that the latter have a place in the physician's mind than in the literature, it is urged as a concept rather than as a mere designation. With his interest in the clinical aspects of this important period increased, the physician's conduct of it can be counted upon to be so satisfactory that even physiologic

blood loss will be minimized, while serious hemorrhage after delivery will become one of the rarest of obstetric accidents.

Although "postpartum" indicates that the bleeding it qualifies comes on after delivery and for this reason might be applied to its occurrence at any time after termination of the third stage and before involution is complete, it is undue blood loss coming on during the third stage when the placenta is actually retained (that is, separated but not delivered), or after delivery of the placenta and within the first twenty-four hours following delivery, to which your attention is directed.

The condition is known as postpartum hemorrhage and the designation is satisfactory only as "hemorrhage" is defined. Although the latter is said to obtain when "physiologic blood loss is exceeded," there must be some standard by which "physiologic" loss is measured if a moderately profuse natural loss is to be differentiated from a hemorrhage of mild degree.

The practice of measuring physiologic loss in ounces has little to commend it. If the limit is low, for instance from four to six ounces, every large woman delivered of a nine or ten pound child and losing from eight to ten ounces of blood within a few minutes would suffer from "postpartum hemorrhage" when, as a matter of fact, the blood lost represents efficiency on the part of the uterus in establishing hemostasis at a large placental site; while, if it were placed a few ounces higher, a slender, undernourished and anemic patient losing six or eight ounces might be considered as having had no more than a "physiologic" loss when, in terms of her ability to stand it, she has had a "hemorrhage" of mild degree.

It is apparent that the amount of physiologic loss is measured not arbitrarily in ounces but in terms of size of the patient and, especially, in terms of her ability to suffer it. There are further standards to which "natural" loss conforms: it should never be abundant in that it flows even slowly from the vagina, nor should it appear in clots.

Reasons why blood does not flow from the physiologic uterus are apparent when experiences with the control of active bleeding from fairly extensive, lacerated wounds in highly vascular tissue are considered. In that the sinuses have been opened up and the placental site is fairly extensive, the interior of the postpartum uterus presents such an appearance. In the former instance, hemostasis that allows blood to flow after compression by appropriate dressing has been applied, may be considered inadequate. On the other hand, such a wound would be expected to ooze. In the latter instance, it is force of the contracting and retracting uterus that applies compression, and the physiologic hemostasis that results permits of oozing; when

blood flows, compression is not perfect and the loss occasioned may be said to be "unphysiologic."

Though coagulation takes place quickly, blood in motion does not coagulate. However, when the flow is retarded, the clotting process goes on rapidly, and the discharge of clots from the uterus is proof of earlier retention of blood therein—in other words, that the uterus has ballooned-up and the clots are its result. Ballooning-up is not characteristic of a physiologic uterus. Therefore, expulsion of clots may be said to be evidence of "unphysiologic" bleeding.

If minor perineal injuries are excepted, postpartum hemorrhage is the most frequent complication of parturition. Readiness with which this view will be accepted depends altogether upon the individual's reaction to what is known as physiologic blood loss. Here the latter is considered to have been exceeded and hemorrhage to obtain, when any unnecessary loss, regardless of amount is sustained.

Causes of postpartum hemorrhage are found in conditions that interfere with or make impossible firm contraction of the placental site. Although deficiencies in the fibrin ferment content of the maternal blood could delay the formation of thrombi and although it is conceivable that increased tension could even dislodge those already formed, and either or both occasion undue blood loss, it is probable that they are no more than predisposing causes and that their influence would be quite completely counteracted by efficiency in contraction and retraction of the uterine muscle. At least it is reasonable to presume they are unimportant factors; because, in the first place, blood lost in postpartum hemorrhage almost invariably clots soon after it is exposed to the air, giving evidence of satisfactory fibrin-ferment activity therein, and, in the second, hemorrhage is no more characteristic of the hypertension of toxemia than it is of labor where pressure is normal. Adequate explanation of postpartum bleeding must be sought elsewhere, and clinical experience bears out the contention that it is found in failure of forces that produce compression at the vascular placental site.

Of the types of hemorrhage that are met in "hourglass" uterus where the separated placenta is incarcerated in the upper segment by tonic contraction ring, that following separation of a placenta located toward or in the lower segment, and that due to muscular insufficiency of the upper uterus, the last alone will be considered. This because it is the type most frequently met, because its clinical picture is thought to be characteristic even though possible of misinterpretation, and, finally, because it is highly preventable as well as amenable to speedy cure.

In the conventional postpartum hemorrhage bleeding is external, or open; it is more or less continuous; and it comes from the upper uterus

that is felt to be soft and feebly contracting. More often, however, it is thought to be concealed.

Bearing in mind the tendency of free blood to coagulate, the presence postpartum of the physiologic retraction ring that makes exit from the upper segment relatively small, and that soon after delivery ample compresses are placed over the vulva and the patient's thighs are approximated, it will be apparent that several factors help to keep uterine bleeding concealed. Blood flowing freely from the poorly contracting placental site is held within the uterus by the coagulum at the lower segment and may remain concealed for a considerable time. Sooner or later, either because increasing distention stimulates the upper uterus to pronounced contractile efforts or because muscular insufficiency that occasioned bleeding in the first place is recovered from, a contraction of sufficient strength appears and both fluid and clotted blood is expelled in a single gush. These are the cases of hemorrhage that "come on" a few hours after delivery when little or no external bleeding has been apparent earlier, and that are claimed to be occasioned by "retained blood clots." That clots are expelled is proof that bleeding has been going on for some time. Further, in physiologic labor there are no blood clots to be "retained." They are produced by gradual accumulation of blood that, for reasons given above, remains concealed until, with a supreme contractile effort, the uterus expels it. In all of these cases it may be presumed that bleeding occurs because the placental site is as soft and poorly contracted as is the uterus about it.

Until blood lost amounts to enough to influence pulse and respiratory rates, there are few if any subjective complaints. However, objective signs are characteristic and are two in number. They are, first, external bleeding as hemorrhage is "open" and, second, increase in size of the uterus as it is "concealed." These rather than the "soft, boggy uterus" are to be looked for. A uterus presents the latter signs only when in a state of profound inertia and when bleeding is profuse.

That the attendant practice "persistent, gentle massage of the fundus" for the first hour postpartum is far less important than that she measure height of the empty uterus and watch closely for evidence of its ballooning. As a matter of fact, the latter is thought to be her chief concern. When several ounces of clotted blood are expressed from such a uterus at the end of the hour, the material is not "retained" blood clot but unphysiologic blood loss that has remained concealed (all the time giving due notice of its presence) until it is expelled by the force expended in artificial compression of the fundus. By the same token, the escape of a mass of fluid and clotted blood from a uterus a few hours after delivery does not necessarily mean a

suddenly developing hemorrhage. The latter has been going on since delivery and the material expelled is the result of gradual accumulation within the uterine cavity; while the patient is about as good a risk at the time as she was an hour or two earlier, for little more has happened than conversion of a concealed into an open postpartum hemorrhage.

External hemorrhage results when blood flows from the uterus or leaves it in clots; while hemorrhage is concealed when progressive increase in size of the postpartum uterus is met. The one indicates an unphysiologic blood loss as definitely as does the other.

Because so many cases of hemorrhage are accounted for on the basis of muscular insufficiency and because the latter condition is so highly preventable, the prophylactic treatment outweighs the active in clinical importance. It should be more satisfactory to the physician and it is far more beneficial to the patient to have prevented a moderately severe postpartum hemorrhage than to have treated it even with most pronounced success.

Prophylaxis means such perfect conservation of uterine muscle energy throughout labor that the postpartum period will be entered upon with the uterus in possession of enough contractile power to accomplish physiologic hemostasis. Prevention therefore begins hours before possible blood loss occurs; and as essentials of it there may be mentioned the following: saving the patient's general strength by keeping her in bed while active labor is in progress and especially by not permitting premature and ineffectual efforts at "bearing down," artificial rupture of membranes when dilatation is quite complete and advance is impossible because the bag of waters does not rupture spontaneously, placing a limit upon the time that frequent, propulsive, second stage contractions are allowed to continue with little or no promise of eventual spontaneous delivery and terminating labor at a time when efficient contractions can be supplemented by traction from below, and, finally, removal of the contents of distended bladder or rectum that of themselves may reflexly inhibit satisfactory uterine action at the time it is needed. The foregoing are urged in order that termination of the third stage will be reached and the uterus found active rather than completely or even partially exhausted.

In this connection it is urged that labor is not necessarily normal because it terminates spontaneously. For instance: when a primipara delivers herself spontaneously of a large child after an active second stage of possibly 4 or 5 hours, the postpartum period is usually entered upon with her store of uterine muscle energy depleted, and undue bleeding is to be expected. Here labor, although it terminated "naturally," was abnormal in that physiologic uterine action following it was impossible. The hemorrhage that followed occurred

because the patient was permitted to deliver herself spontaneously. Had work to be done and available muscular energy been adequately judged, operative delivery would have been brought about earlier and the degree of hemorrhage would have at least been greatly diminished.

Unquestionably, more satisfactory convalescence would be experienced in many cases were expulsive efforts supplemented by judicious efforts at traction as soon as it is evident that the uterus has done its best. Presence of a well-defined caput and of satisfactory molding show that the uterus has been efficient, while lack of progressive advance proves it unequal to the supreme efforts that result in delivery. Conservation calls for preservation of all possible muscular energy for the postpartum period; and little if any can be expected to be available if the uterus is allowed to continue its ineffectual expulsive efforts too long. The foregoing is not to be mistaken as an appeal for more general employment of operative delivery. It is meant to establish the conviction that operative delivery not infrequently is a conservative procedure in that it substitutes the slight dangers of proper forceps application for the graver ones that result from quite complete physical and nervous exhaustion incident to protracted labor.

Because muscular insufficiency can be expected to follow the operative termination of labor in the complete absence of uterine contractions, it is apparent that neither may be allowed to continue so long without interference that profound inertia develops nor may delivery be accomplished under the influence of anesthesia so deep that the uterus is as completely relaxed as are the skeletal muscles.

It is rare for marked inertia to develop suddenly. As a matter of fact, its onset is commonly gradual; and the deeper and more dangerous degrees can be prevented if decreasing efficiency of contractions in the presence of such adequate causes of inertia as disproportion, malpresentation, malposition, and flabby musculature are interpreted as evidences of beginning insufficiency and if the failing forces are at once supplemented by properly selected operative aids. A deep, late, second stage inertia, or one coming on postpartum, is proof that the particular uterus has worked too hard; if opportunity to observe the case has been afforded the physician, it is proof that operative assistance has been too long withheld.

Undue postpartum blood loss demands active treatment that is adequate; and as its essentials, there are urged the immediate and permanent control of bleeding in every case, and replacement of fluid mass lost and combat of shock in cases where seriousness of hemorrhage makes one or both necessary. Hemorrhage is to be stopped at the earliest moment possible; and the success or failure that attends one's effort in this direction determines how necessary

will be such procedures as infusion, transfusion and the like. For instance: if blood clots were expressed from a moderately ballooned-up uterus one hour after delivery and firm contraction and retraction of the particular uterus secured, the possibility of a much more severe "open" hemorrhage several hours later would be remote and the necessity for active general treatment that the loss might demand would not arise.

It is a matter of experience that in many cases of postpartum hemorrhage, bleeding is checked with difficulty even though all the conventional methods of control have been employed. If the procedures have been carried out properly (and such is almost invariably the case) and bleeding persists, it is logical to conclude that those employed were not suited to control of the particular hemorrhage.

Why bleeding in many cases may be expected to continue in spite of customary methods of control is apparent when the following facts are considered: first, the commonest causes of hemorrhage are muscular insufficiency (that is, varying degrees of inertia) and low placental implantation; and, second, the usual methods of control, namely, vigorous massage of the fundus, indirect stimulation by pituitary extract and by ergot and intrauterine stimulation by means of the closed fist or of hot, astringent douches, depend for their efficiency upon the ability of the uterus to respond with vigorous contractile efforts. It is unreasonable to expect the uterus to supply something it has already given evidence of lacking.

With the placental site in or encroaching upon the lower segment, more or less bleeding persists even though the upper segment contracts and retracts spontaneously or is made to do so by stimulation. Hemorrhage of this type can be counted upon to persist until formation of multiple thrombi in the more or less inactive lower segment occludes the bleeding vessels and sinuses. The process is relatively slow and, in these cases, tamponade of the entire uterus offers the only assurance of immediate and permanent control of bleeding.

To the extent to which the postpartum uterus is muscularly insufficient, it will fail to respond to stimulation of all kinds. Further, it must be remembered that stimulation of a tired uterus does no more than excite it to increased efforts that cannot be counted upon to be maintained and that, when the latter wear off, the degree of insufficiency is increased. Pituitary extract and ergot draw from, they never add to, the store of valuable muscular energy of which the uterus is possessed. They are valuable aids in the treatment of hemorrhage but they may not be depended upon as cures.

When efforts at stimulation have failed to excite the uterus to activity, it is apparent that the organ is unable to respond and that further administration of drugs or application of measures that de-

pend upon latent muscular efficiency to accomplish results may not be practiced. The means to be employed now is firm intrauterine tamponade and nothing less affords the patient complete protection against further blood loss to which she is entitled.

The sound principle that the puerperal uterus should not be invaded does not hold when postpartum bleeding persists, because necessary ends can often be accomplished in no other way than by invasion by a force that stops bleeding at its source.

Intrauterine tamponade can be counted upon to check any postpartum hemorrhage; and such preparations should be made that it can be carried out without delay as soon as the more conventional methods demonstrate their inadequacy. Not only is it the most efficient method of active treatment of hemorrhage; it is prophylactic as well in that it makes subsequent blood loss negligible. It expedites the convalescence from antepartum and intrapartum hemorrhage by making even "physiologic" postpartum loss impossible.

While the management of lost blood mass and shock is important, it is with prevention of these states that the obstetrician is primarily concerned. The time to infuse or to transfuse is before shock is fully developed, and shock may be expected when a difficult operative delivery, particularly one in which extensive trauma to the maternal soft parts has been done, is followed by hemorrhage even of moderate degree. Nothing may avail when shock is preliminary to collapse; while satisfactory results are not impossible in ordinarily grave cases when vigorous general treatment is instituted early enough.

There is nothing in medicine more interesting than the defense of the parturient against blood loss; and there is no problem that can be perused with greater profit than that of reduction to the minimum of hemorrhage incident to labor.

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DISCUSSION

DR. GRANDISON D. ROYSTON, St. Louis, Missouri.—I think the remarks of Dr. Harper are well taken in regard to conserving the patient's energy during labor. We too, attempt to conserve the strength of our patients during labor. Since Dr. Polak's paper on the management of the third stage of labor appeared in 1915, I have insisted upon every class memorizing that paper as near as they could, telling the students that it would be one of the final examination questions. Dr. Polak has said that spontaneous detachment of the placenta is one of the most important factors in preventing postpartum hemorrhage. Since following his method of placental stage management, I have seen but one hemorrhage that caused trouble. This patient was a gravida II, a rather anemic individual, who was delivered within ten minutes after reaching the hospital. There was no bleeding from the time of the delivery until the placenta was spontaneously expressed, ten minutes after delivery. That goes hand in hand with previous observations, and, I have never seen a woman have an alarming postpartum hemorrhage who had not had a short third stage.

DR. JOHN OSBORN POLAK, Brooklyn, New York.—Dr. Harper has brought out the point that postpartum hemorrhage, particularly when occurring at the placental site, depends wholly on the retractility of the uterus. The actual blood lost in a thousand cases, from the moment the baby was delivered until the uterus had retracted and contracted and all bleeding had ceased and the uterus was firm, was less than 250 c.c.; some of them had as little as 30 c.c., some as little as 100 c.c. We had three cases in which the blood loss exceeded 600 c.c. All these cases were treated on the same plan that Dr. Royston has spoken of, and that is leaving the uterus to take care of itself, allowing physiologic separation and expulsion. Immediately upon expulsion of the placenta the patient receives an ampule of pituitrin. One of the important points is that the uterus shall not become tired before delivery. Why should we carry the second stage over three and four hours when the woman is not doing anything but using up her strength and lowering that muscular tone which cannot be regenerated?

Another thing that comes out prominently in these cases of blood loss is that the uterus will contract and retract if for a moment the blood supply of the uterus is shut off; in other words, a bleeding uterus or relaxed uterus is constantly losing strength by every drop of blood that is lost, and if we can shut that off by compression of the abdominal aorta, the blood supply to the uterus, it is amazing to see how quickly a tired uterus will come together and retract. In the third stage, the uterus goes through the physiologic acts of separation, expulsion and retraction, just as it has affected dilatation of the cervix, and conservation of the muscular tone during labor, assures retraction when the uterus is empty.

DR. EDWARD SPEIDEL, Louisville, Kentucky.—I am glad to hear the results of Polak's investigations in regard to the amount of blood lost after the birth of the baby, because a few years ago, Williams, of Baltimore, published investigations made at the Johns Hopkins Hospital in which he found that it was common for a woman to lose 500 c.c. of blood after the birth of the child. Quite a number of women lost 1000 c.c., and some as much as 1500 c.c. without giving symptoms of postpartum hemorrhage. Polak's figures are one-half the figures given by Williams as the lowest, and they are important for the reason that they give us some clue as to what can be called normal blood loss in a woman. It would be unreasonable to suppose that a woman could lose from one to three pints of blood in a normal labor without showing considerable distress.

Another point in Nature's method of checking hemorrhage was not mentioned by the essayist, that namely, the blood vessels of the placenta are elastic, and when in consequence of the contraction of the uterus the sinuses are torn through they retract into the muscle bundle, and the muscles being arranged in the form of a figure of eight, contract down upon them and ligate them in that way.

I think a very important thing in the prevention of postpartum hemorrhage is to stop instructing our trained nurses, as soon as a baby is delivered to put their hands on the uterus and manipulate it. That is followed in our city to a great extent, and I believe the trained nurses hereafter should be taught to let the uterus entirely alone after the birth of the child and leave it to the physician to watch for any sudden dilatation and hemorrhage from relaxation.

HABITUAL ABORTION

By J. K. Quigley, M.D., Rochester, N. Y.

WHAT shall we do for the woman the subject of repeated abortions, who is usually extremely desirous for children? Like sterile patients they often tax our ingenuity to afford them relief and treatment many times gives disappointing results. To quote DeLee[1] "'Habitual abortion is one of the disappointments of medicine—the editor admits frankly he has made little headway in the treatment of his cases—if syphilis does not exist little can be done, infection of the uterus causes some cases but it is not amenable to treatment, to determine the cause of the frequent interruption of pregnancy is seldom possible and we are forced to empiricism, itself very unsatisfactory.'' It seems to me that DeLee is a bit too pessimistic, for it is not true that in the absence of syphilis ''little can be done,'' that while there are many cases other than the syphilitic, the etiology of which is obscure and treatment seems hopeless, nevertheless we do encounter some that yield to treatment, even though it be empiric.

There is still much to be learned of the etiology and prophylaxis of repeated interruptions of pregnancy. This is a fertile field for investigation and I believe that, like many other problems in medicine apparently impossible of solution, this one will some day be cleared up. As logical treatment is dependent upon etiology, these are the two phases of the subject I wish to touch upon in review today. Of the causes of abortion in general and of repeated abortions in particular, syphilis, it has long been felt, played by far the greatest rôle. A positive Wassermann was obtained in 25 per cent of Royston's[2] series (164 cases) at the Washington University Dispensary, but in a more recent study by Cosbie[3] of 292 cases of abortion in the service of the Toronto General Hospital only 11 gave a positive Wassermann or 3.8 per cent. The only three women giving a history of five or more abortions were all nonsyphilitic. Ten cases in my own experience having 3 to 7 abortions gave a negative Wassermann. It is rather difficult to reconcile these two reports, showing 25 per cent in one series and 3.8 per cent in the other. It is possible that Royston's cases included those interruptions of pregnancy up to seven or eight months and Cosbie's only the first three months, as the term abortion is interpreted by some. Less than one-third with positive Wassermann reactions give a history, or show physical signs of the disease. Only 60 per cent of the pregnancies in the syphilitic reach full term. To those cases in whom syphilis is recognized fairly early in pregnancy and intensively treated

many children are born at or near full term apparently healthy. This is one of the most promising fields in prenatal care and yet according to Williams' series[4] there are not a few instances of syphilitic children born to mothers who are Wassermann free. This valuable test is far from infallible, particularly in pregnancy. It is too early to dogmatize upon the value of preconception or prenatal prevention of congenital syphilis, this has been widely carried out during the past decade in many clinics and the results seem very good in that a large percentage of the newborn show none of the usual stigmata of syphilis and give negative Wessermann tests. It would seem, however, that another decade would be necessary and a careful follow-up of these cases to exclude the possibility of development later in life.

Other diseases like decompensated cardiac disease, diabetes, Graves' disease and nephritis may terminate gestation repeatedly. I have one patient who has aborted three times in her fifth month from a very rapidly developing nephritic type of toxemia, in spite of prophylaxis against the toxemia and absolute rest on the first symptom threatening miscarriage. Alfred Griel[5] advances the theory that the etiology of habitual abortion is the etiology of pregnancy toxemia, his treatment comprises elimination, a diet with a minimum of proteids, with abundance of acid fruit, 5 per cent calcium chloride solution intravenously and the oral administration of iodide of iron. As a last resort in cases which fail to respond to this treatment he advises the serum of pregnant women who have reached the same period of gestation.

Lacerations of the birth canal, particularly of the cervix, have long been held accountable for this condition. As a principal cause I think this has been exaggerated, for repair of the cervix often fails. A marked cervicitis, with a resultant endometritis, is a more logical factor I believe. Only recently a patient under treatment for profuse purulent leucorrhea conceived; the endocervicitis grew worse, because of the danger in carrying on energetic local treatment, and the patient aborted at four and one-half months spontaneously, followed by a moderate intrauterine infection.

Malpositions, particularly retrodisplacements, by inducing an extreme congestion of the uterus leading to hemorrhage into the decidua sometimes cause the interruption of several pregnancies in the same subject. However many patients with retroflexion go through pregnancy free from the least indication of threatened trouble. Fibroids, particularly submucous or intramural and polypi, are possible causes.

Adhesions to the uterus from previous inflammation of neighboring organs, as the appendix, or from a previous cesarean section, may so interfere with enlargement of a pregnant uterus as to cause it to expel its contents. I saw an illustration of this three years ago in a patient who had aborted four times between three and one-half and five months, she had had attacks diagnosed as chronic appendicitis and was tender

over McBurney's point. In addition, pain was elicited on pelvic examination on pushing the uterus (of about three months' development) to the left of the abdomen. Rest in bed for a long time with instructions to lie upon her right side was advised. She went on to a successful delivery at term. Since then there has been one pregnancy during which she did not observe these precautions and she aborted in her fourth month. Endometritis though not a common condition, is probably occasionally responsible for miscarriage, particularly following an incomplete abortion with mild infection, thus setting up a vicious circle often referred to as the abortion habit, which can sometimes be broken by putting the pelvic organs in a condition more nearly normal, possibly by curettement and by hygiene and contraception for one or two years. Pregnancy recurring rapidly before the involution is complete and the endometrium in a healthy condition leads only to another disappointment. Most of the etiologic factors above enumerated are more or less easy of demonstration and likewise of treatment but there are a large number of women who abort repeatedly in which none of these causes are found. I think it is this class that Cragin[6] had in mind when he said "It must be recognized that the successful treatment of habitual abortion is often extremely difficult and attempts in this direction often meet with disappointment."

Psychic influence, increased irritability of the uterine muscle and derangement of the centers governing uterine contractions all sound specious but none of these will account for the abortions in which the fetus exhibits unmistakable evidence of having perished some time previous to its expulsion. These cases would seem to argue for a cause inherent in the fetus itself. This is as difficult of demonstration as is the cause of death in the rare cases of habitual death of the newborn and opens up a field for investigation, and treatment possibly through serology. Diseases of the chorion and decidua growing upon an unhealthy endometrium undoubtedly is responsible for many abortions often attributed to retroflexion, trauma and cervical laceration, the latter acting as an exciting cause only. Disturbance of the endocrine balance between pituitary, thyroid and ovary has been advanced by many and treated by some successfully by administration of glandular extracts. I can report but one case thus treated, a patient of 23 who had had three abortions at three months, she was put to bed and given corpus luteum extract intramuscularly, 1 c.c. daily, for a fortnight, she went on and was delivered at full term. This case is not at all conclusive inasmuch as she did not receive corpus luteum for a very long time and she also had advantage of absolute rest in bed which she did not have in her previous experiences.

I wish to report two cases in abstract illustrating the apparent benefit of rest in bed for a long period of time. The first, thirty years of age, self and husband Wassermann negative, has had no full term

pregnancies and four abortions between the third and fifth month, she was kept in bed from her first missed period up to eight or eight and one-half months and delivered at full term. The second had had one full term pregnancy followed by three abortions in the third month attributed in the first instance to a retroflexion. This was corrected and did not recur in the last two abortions, similarly, she was put to bed and kept there until well into the ninth month and was delivered at term. Case 3 illustrates the failure of absolute rest in bed and sedatives to always prevent abortion.

Case 3.—Mrs. E. L., aged twenty-seven, para iv, married seven years, had three abortions without obvious cause at two, two and two and one half months respectively. She was curetted (?) each time after her abortions without an anesthetic she said; each interruption was apparently a missed abortion. Family and personal history irrelevant, menstrual history normal. Wassermann test and urine normal. During her fourth pregnancy she was put to bed immediately after her first missed period and given viburnum and bromides. She was very faithful in following out orders, her rest was absolute. At the end of her fourth month she had brownish spotting without pain, which continued for ten days when she passed a fetus of about three months' development. The fetus and placenta were sent to a pathologist for examination of the liver, spleen, etc., by the Levaditi method and the decidua for histopathologic examination. No evidence of luetic infection was found. The course advised for this patient after this was (1) avoid conception for at least one year then (2) a curettement and (3) rest in bed at the first evidence of pregnancy and corpus luteum extract administration daily.

Two cases illustrating empirical treatment but which nevertheless gave birth to living children.

Case 4.—Mrs. J. K., age thirty-three, para v, milder diseases of childhood, always quite well in adult life. At twenty-eight was operated on for chronic appendicitis and a nephropexy done. Menstrual history began at thirteen; regular, twenty-eight day type, lasting three days, of moderate amount and painless.

First pregnancy uneventful, terminated by instrumental delivery near term of a 5 lb. girl, some lacerations repaired. About one year after this delivery she was again pregnant and at seven months became very uncomfortable from pelvic pressure. She had a miscarriage at seven and one-half months of a 5 pound baby which lived 24 hours. Two years later she had identically the same experience, a 5 pound baby at seven months, which lived 24 hours. After this second interruption of pregnancy she was told the lacerations caused her misfortune and accordingly she underwent a perineorrhaphy and trachelorrhaphy. She again became pregnant and notwithstanding the fact that she exercised great care not to overexert herself, did no housework and rested in bed much of the time, her experience was identical with the two previous pregnancies, namely; miscarriage at seven and one-half months of a 5 pound baby which lived twenty-four hours only. Wassermann tests from two laboratories upon herself and husband were negative. General physical examination negative. She was told to report after her first missed period. This she did just two months later, she was given yellow iodide of mercury gr.¼ t.i.d. and told to avoid overexertion and to rest in bed at the time of her menstrual periods. Four months later she reported gingivitis, so the mercury was discontinued. Three weeks later its administration was resumed. During her sixth month she was given three doses of arsenobenzol 0.3 grams. In her seventh month she was in bed about

half of the day, she went on to her ninth month and was allowed more freedom; ten days before her expected date she went to labor was delivered of a 7 pound girl which at three years is quite normal. Two years later she was delivered in her ninth month of a normal boy. During this pregnancy she was given yellow iodide of mercury but no arsenobenzol.

CASE 5.—Mrs. V. B., age twenty-five, para vi. Family and personal history negative, menstrual history began at 13, recurred regularly at twenty-eight day intervals lasting three days, of moderate amount and painless. Obstetrical history: First pregnancy terminated at five and one-half months; second at six and one-half months, lived two days, cause, attributed to exposure to cold; third at six months, stillborn; fourth at four months, attributed to slight fall; and fifth terminated at eight months plus, 3 pounds 3 ounce baby, lived two days. During this pregnancy she was in bed three to four months. Patient first reported at completion of fourth month, the physical examination was negative, two Wassermann tests were "of doubtful significance." One Wassermann test on husband negative. She was told to rest as much as possible and to avoid overexertion; one-fourth gr. protiodide of mercury three times daily prescribed. She went into labor at the end of the eighth or the beginning of the ninth month and spontaneously delivered a baby of four and a half pounds. Lactation was established satisfactorily and accordingly she was given on her fifth, seventh, and eleventh days postpartum respectively 0.3 gm. of arsenobenzol and to the baby was given mercury inunctions for three weeks. For a premature infant this baby did well and three years later seems quite normal.

Many of these cases of habitual abortion are undoubtedly inevitable and it often seems futile to persist in prophylactic care after hemorrhage begins and persists in a patient who has had the benefit of prolonged absolute rest in bed. As one can never be absolutely certain that any given case with threatening signs is inevitable, the only course, even though morally certain that the pregnancy will terminate soon, is to temporize. I recall three cases within the past year illustrating this, and the size and development of the fetuses when passed confirmed my earlier opinion that death had occurred at the time of the first hemorrhage or prior to it.

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303 ALEXANDER STREET.

DISCUSSION

DR. ABRAHAM J. RONGY, NEW YORK, CITY.—Possibly the greatest misunderstanding connected with the question of abortion, habitual or otherwise, is that we are constantly looking for the cause of the abortion in the woman. We seem to forget that there is also a growing fetus, and, as Dr. Brown demonstrated yesterday by the exhibition of his specimens, are found. I dare say a large percentage of abortions take place because the fetus dies in the process of development, and that the woman is not at all responsible for the abortion.

A better knowledge of intrauterine fetal pathology will probably explain why abortion takes place in many patients.

DR. ASA B. DAVIS, NEW YORK CITY.—We have not gotten very far in treating these cases of habitual abortion, or the cases that go on to nearly full term with a living child and then deliver themselves of a stillbirth. I thought I would be able to forestall one case, and delivered the woman with comparative ease of a well-developed, healthy child, but in two days it passed away. In another case the child went to full term and died during an easy labor. The mother's blood was normal. Hundreds of sections were made of the fetus and we found nothing, but in taking the husband's history it was found that twenty years before, he had had syphilis which was supposed to have been cured.

There are a great many of these cases caused by late syphilis which do not show a positive Wassermann, and yet the infection is there. I think this is the explanation for many of these cases of full term development and habitual abortion.

UTERINE DISPLACEMENTS AND PREGNANCY

By Benjamin Rush McClellan, M.D., F.A.C.S., Xenia, Ohio

SIX years ago, Dr. John Osborn Polak published a paper entitled "A Detailed Study of the Pathological Causes of Sterility with the End-Results." His words of introduction are so graphic and stirring that they are worth many times repeating in this presence: "Probably no subject is of such sociological significance to the gynecologist as that of sterility. Homes are wrecked, lives are sacrificed, and fortunes are lost, all because of the inability of a woman to conceive or to successfully bring forth the fruits of her conception." Our subject touches only a small portion of this great field. Nevertheless, it is sufficiently important to claim attention. Some one has said that it is much overwritten but still unsettled. So long as gynecologists differ radically in their opinions, is it not our duty to keep at the threshing until the wheat is separated from the chaff?

First, then, let us consider the importance of the subject. Child tells us that "retrodisplacements of the uterus are among the most common pathological affections of the female generative organs, and have much to do with sterility and lessened fertility, but it is next to impossible to give even approximately accurate statistics regarding their frequency and effect on procreation." Winter, who made a very careful study of 178 cases of sterility, estimates that malpositions of the uterus account for about 8 per cent of sterility in the human family. Seitz says that out of two hundred cases examined for sterility or habitual abortion 26 were operated for retroflexion. Polak says that out of 244 cases of sterile women without inflammatory complications there were 20 who were treated for retroflexion.

On the other hand, there are gynecologists who say that displacements of the uterus are of negligible importance as a causative factor in sterility. One of these is quoted as having facetiously said that "a woman's round ligaments would have to be shortened as often as a man would need to have his hair cut if she would keep the uterus in so-called normal position." Another writer on the subject tells us that "the uterus functions perfectly in any position so long as there are no inflammatory complications." Is it not likewise true that the chances of a fruitful pregnancy are much in favor of the normally placed uterus?

Not a few gynecologists decry all operative intervention in eliminating the causes of sterility and tell us that "endocrines will clarify the question of uterine displacements and sterility and thus

avoid operative measures which leave many distressing sequelae." Another says that he "has discarded all the classical suspensory operative methods of fixation of the uterus on account of too large a proportion of failures, especially in respect to subsequent pregnancies."

This diversity of opinion makes it well worth while to spend some time in discussing a subject that spells weal or woe to many of our clients. The writer lives in a strictly rural community in which the pioneer residents were largely Scotch-Irish. As a rule, the first families of these sturdy settlers were very large, an average of ten-plus. The second generation had an average family of less than five; the third, of one-plus; the fourth average is less than one-half of one. Indeed, many of these pioneer families have no male descendant, and face extinction in a few years. The desire for the perpetuation of family name and type is ever strong, and many times it is very important. More than once has it occurred that the timely correction of a misplaced uterus has been the means of saving to the community a type of citizenship greatly to be desired.

I would like to quote somewhat at length from Child's recently published book entitled, "Conception and Sterility." He says, "The congenital type of displacement is of particular importance and calls for an early replacement because the influence exerted by the continued displacement leads to permanent changes in the immature organ. In the acquired type, arising later in life, at a time when the uterus has achieved its full development, permanent pathologic changes are not so apt to occur. * * * Retrodisplacement of the uterus becomes an active factor in the causation of sterility in one of two ways, either the pathologic changes in the uterus resultant upon its abnormal position prevent conception or result in an interference with pregnancy when conception has occurred. * * * While it is quite true that the retrodisplaced uterus may become pregnant and that the pregnancy may even correct the displacement spontaneously as the uterus enlarges, the pregnancy going on to term, we know by experience that this is *the exception rather than the rule.*" To these excerpts I would like to add the following from Graves, "Women with retroversion are apt to be sterile, especially those in whom the retroversion is due to congenitally weak supports. In this case the sterility is the result of the displacement of the cervix uteri which no longer dips into the receptaculum seminalis. * * * Acquired malposition of the uterus may prevent or limit fertility. There is no doubt that women with acquired retroversion-flexion are in a large percentage of cases sterile. That the malposition is the cause of sterility is shown sufficiently well by the frequency with which

these women become pregnant after restoration of the uterus to its normal position." And the following from Crossen shows the same trend of thought: "Repeated abortion without apparent cause is another condition that should arouse suspicion of uterine retrodisplacement. * * * Sterility is in some cases, apparently due to retrodisplacement, though not as frequently as to anteflexion of the cervix and associated conditions. Not infrequently in a married woman who has long been sterile, pregnancy follows correction of the displacement. Occasionally the pregnancy follows so promptly as to leave little doubt that the sterility was occasioned by the displacement itself (compression of the tubes?) and not by any associated inflammatory trouble in the cervix or body of the uterus." The writer fully concurs in these opinions.

Where a congenital displacement of the uterus is associated with a short anterior vaginal wall, sterility is the rule. These cases are not relieved by the use of the pessary until the anterior vaginal wall is lengthened. When this type is also associated with an arrest in development of the uterus, which seems to be the rule, the latter condition will call for an active stimulation applied directly to the uterus. Probably the safest and best is the introduction of iodoform gauze tightly packed and allowed to remain for two or three days and repeated at frequent intervals until the depth of the uterus approaches or attains the normal. Hirst suggests electrical stimulation, which no doubt deserves more general use with careful record of results.

In dealing with long neglected displacements the writer has almost uniformly found pathologic changes not only in the uterus but in the adnexa. Often there were marked changes in the tubes and ovaries; the former congested, compressed and kinked. The ovaries were seriously involved; the capsule was much thickened and the parenchyma of the gland seriously atrophied, due, no doubt, to development of numerous cysts of varying size.

Reed in discussing the baneful influence of uterine retrodisplacements upon the procreative functions of the ovaries, makes the following statement: "Retrodisplacements of the uterus have a directly destructive effect upon the integrity and functional ability of the ovaries, and cystic ovaries with thickened tunics are an invariable accompaniment of chronic uterine retroflexions." The writer can verify this conclusion as true in every case of which he has had personal knowledge.

Reynolds also calls attention to the importance of this phase of the subject when he graphically challenges our thoroughness by saying: "The futility and injustice of the performance of an abdominal operation for sterility without attention to the needs of non-

ovulating ovaries is a very common mistake. * * * Prominent among the useless operations are those which are done for the relief of retroversion without recognition of one of the functional derangements of the ovaries which imply nonovulation, or of a preexisting anteflexion from the existence of short anterior attachments of the cervix."

In the matter of treatment, the writer believes that uncomplicated retrodisplacements of the uterus can sometimes be corrected by the selection of a well fitting pessary, together with the use of approved hygienic and therapeutic measures. These are to be given a fair trial, but if results are not satisfactory operative intervention is imperative. This will at the same time give ample opportunity to correct any complicating or associated pathology in the pelvis or abdomen. Curettage and stem pessaries are here mentioned only to be condemned.

The writer's personal preference is for the Gilliam technic, and he avoids such modifications as the obliteration of the pouch of Douglas as suggested by Deniker, fearing complications during parturition. This objection is wholly theoretical; experience may prove this fear unfounded. In the cases where pregnancy is not a possibility the latter technic is undoubtedly an excellent safeguard against a recurrence of the retroflexion.

Dr. Dorsett, in a most interesting paper on this subject, reports ten cases of sterility successfully treated. One patient became pregnant following the use of a well fitting pessary, two after the use of a pessary and repeated dilatations, one following a Dudley operation, two after a Gilliam operation, one after an Alexander operation, two after a Gilliam operation and repeated dilatations, one following a Gilliam and Dudley operation.

In the last three years, the writer has successfully treated two cases of congenital sterility associated with hypoplasia, and five cases of acquired sterility, all by the Gilliam technic. All were due to retroversions, and all had sufficient pathologic lesions in the pelvis to warrant operative intervention in addition to the hope of a resulting fruitful pregnancy,—a hope that has been realized in each case.

CONCLUSIONS

1. Uterine malpositions are the cause of sterility in a limited number of cases, probably not over 10 per cent, which, though small, is quite too large to be negligible.

2. Long continued sterility or repeated abortions should lead one to suspect a displacement of the uterus.

3. Malpositions act as a cause for sterility by (*a*) mechanically interfering with the progress of the spermatozoa into the uterine cavity, and (*b*) by contributing to the functional disability of the

tubes and ovaries which when long continued, results in organic degeneration, especially in the ovaries.

4. In a very few well selected cases a well placed pessary plus wisely directed hygienic and therapeutic remedies should be given a fair trial.

5. Operative intervention is indicated in all cases where the foregoing treatment has failed, and where there is no legitimate contraindication.

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DISCUSSION

DR. HERMAN E. HAYD, Buffalo, New York.—The subject which the doctor has presented this morning is as fecund as it was fifteen years ago when I wrote a number of papers on retroversion of the uterus and which led, as you may remember, to a very active and acrimonious discussion as to the methods which were to be employed in their treatment.

The abstract of the doctor's paper as given in the program reads, "are displacements of the uterus responsible for sterility?" Yes, but there must be some other elements than the mere mechanical difficulties and they certainly come later from obstruction to drainage. Therefore, we must realize that every displaced uterus may sooner or later be associated with a catarrhal endometritis or a catarrhal salpingitis which will, of course, increase the acidity of the vaginal secretions and necessarily interfere with fecundation. I am satisfied that there does exist a class of retrodisplaced uteri that do not produce symptoms, although I am equally satisfied that sooner or later many of these uteri will produce symptoms, and when they do so, they should be operated upon, as I think a pessary is only useful in recently retroverted or retroflexed uteri. A uterus that has recently fallen after a miscarriage or after labor should be treated with a pessary, and if the woman wears the pessary for a few months and it is found, when it is taken out, that the uterus has fallen back, we should consider the case a surgical one and operate.

The doctor has spoken of and seems to endorse strongly the Gilliam operation. I am going to make a plea for the Alexander operation in uncomplicated cases of retroversion of the uterus; I mean cases where there is no recognizable tubal or ovarian trouble and the uterus is movable and yet producing symptoms. I have done a good many Alexander operations and I have succeeded in having women bear one, two and three children after this operation; they are grandmothers now and their daughters I have operated upon for retroversion. I have seen in one family three women upon whom I have done the Alexander operation, wherein the uterus stood the test of pregnancy, where it remained in position, and where the women were relieved of their symptoms and of all possible late intraperitoneal complications which were the result of operations, which open the adbominal cavity. However, when we have a different class of cases to deal with, where the tubes

and the ovaries are involved, then we must employ an abdominal method as these are not uncomplicated cases of retrodisplaced uteri. Perhaps, once in a while, we may make a mistake in diagnosis in a case where some slight adhesion may exist, or probably a tube may be thickened and closed, but after all, these mistakes should be rare. Unfortunately it is claimed that all symptoms producing retrodisplacements necessarily have tubal and ovarian pathology or there is present chronic appendicitis or some other intraabdominal trouble, so the abdominal operation is done, not alone for the retroposition, but to explore the abdomen. It is so much easier to do this, than it is to do an Alexander operation. I have done many Gilliam operations; I have done quite a number of Webster-Baldy operations, and I have made up my mind after twenty-five years of experience, and you will not change the result of that experience by your discussions today, and I shall continue to do the simple looping, reduplication of the round ligaments operation such as Mann described years ago, as it holds the uterus up and causes fewer adhesions and subsequent complications. I do not care particularly what operation you do on the round ligament as long as you reduplicate it sufficiently and sew it together with linen, being careful not to take too much of the ligaments or tie the sutures too tight, so that the ligament atrophies and shrivels up. If there is a heavy uterus, tuck it up to the abdominal wall with a fine catgut, to hold it in place for a few days, and sometimes, if the uterus be large and heavy and the broad ligaments sag, then you can shorten the uterosacral ligaments by putting a couple of stitches through them. I think with this simple technic you can place the uterus permanently where it belongs and you leave the ligaments in position to pull the uterus in the direction which nature originally intended. If the ovary has fallen into the culdesac, shorten its ligament with a couple of fine linen sutures and thus hold it in place.

DR. RUFUS B. HALL, CINCINNATI, OHIO.—I should like to endorse the excellent paper that has been presented, as well as the remarks of the last speaker. When we come to consider the question of sterility in women, the essayist only considered one-half of the problem. When a woman comes to you and says that she is sterile, that she has been married five or six years, and wants to have a baby, a very important and interesting problem presents itself to you. You examine the woman and are not quite certain that there is pathology enough present to justify the sterility. Examination may simply show a retroverted uterus which may be the cause of her sterility.

I want to present the other side of the picture. A case came under my observation a few days ago. The husband was thirty-eight years of age, had been married seven years, but they had had no children. The wife was examined by six different men. She had had three curettements and was promised that she would be well. She had worn a pessary which seemingly corrected the retroversion, but still she did not become pregnant. After obtaining this history I said, "Very well, madam, go into the adjoining room," and after she went into the room I turned to the husband and said, "When did you have gonorrhea?" He replied, "I have not had that since I was married; I had it before." I sent him to a specialist who found that he was absolutely sterile. I did not do anything for his wife.

DR. WILLIAM PFEIFFER, BROOKLYN, NEW YORK.—The remarks made by the last speaker concern one of the points I want to bring out. We feel that no operation should be undertaken until two things have been done. We should not operate on the female genitalia for sterility until the male partner is first examined. And the second point is, are the tubes patent?

DR. HUGO O. PANTZER, INDIANAPOLIS, INDIANA.—A patient confined in the last week came to me after having been married six years. I found she had a

retro- and right lateral retroflexion of the uterus. I found associated with that ileocecal torsion and a very much shortened ileotendinous band coming down from the ileocecal junction to the ovary. I cut the ileotendinous band, lengthened it and she subsequently had a baby.

DR. JOHN OSBORN POLAK, Brooklyn, New York.—There is one point I want to bring out in regard to the doctor's paper, most of which we all endorse, and that is, there is a very great difference in the action of spermatozoa that you examine under the microscope and those examined *in situ*. For the last five years we have been examining these cases after intercourse to determine the condition of the spermatozoa. Many of these retroversions that were formerly operated on have surprised us. Many of these anteflexions on which we have done operations on the cervix have surprised us by our finding living straight tail spermatozoa well within the cervical canal; consequently, it seems to me, that in any discussion of this sort, not only the anatomical factors on the part of the woman but the potency of the man as the doctor brought out should be investigated, particularly the potency of that man with that particular woman.

Another interesting thing is that there is something more important in the man than even the production of spermatozoa, because women in whom we have demonstrated patent tubes and the presence of spermatozoa inside the cervical canal, and who at operation had apparently healthy ovaries, have not conceived, and yet those same men have married other women and pregnancy has followed. Consequently there must be something in the claim made by genitourinary surgeons, that the stimulation of the sexual act and the consistency of the semen have something to do with the question of sterility. I do not believe we should go on record—and we have all seen certain cases of retroversion of the uterus after correction become pregnant—that that operation or any operation of itself has produced this or that particular pregnancy. There may be something in the stimulation at the time of copulation that does not occur at another time.

DR. EDWARD SPEIDEL, Louisville, Kentucky.—There is another feature to consider in connection with these cases, and that is, with a uterus in the normal position we have healthy arterial circulation, whereas in retroversion we have a passive venous congestion which interferes with normal function.

PRIMARY STERILITY

By A. J. Rongy, M.D., F.A.C.S., New York, N. Y.

THE subject of sterility in women has greatly absorbed the interests of investigators and clinicians in recent years. The numerous contributions to the subject are to me an indication that our present knowledge of the subject is incomplete, that the methods heretofore employed in the treatment of sterility have failed to accomplish the desired results, and that we are still groping in the dark as to the true etiology of primary sterility in most cases.

During the past two years I carefully followed the more important publications on the subject and I believe that I have a fair knowledge as to what has been written concerning all the phases of sterility. Keen interest is displayed everywhere to find something which will help to cure that group of our patients, who consider themselves the most "cursed" members of society.

There are at present two definite groups of investigators: First. those who concern themselves with the male aspect of sterility as it relates to the virility of the spermatozoa. Careful studies have been made of the spermatozoa, as to their mode of travel to the interior of the uterus and the length of time they survive there, and the effects of the cervical and vaginal secretions upon their motility and viability.

These investigations are interesting from an academic standpoint but clinically they did not help us very much in our treatment of sterility. It was thought at one time that if spermatozoa were deposited high up in the uterine cavity, they would be in a more fit condition to impregnate. Artificial insemination, therefore, became one of the methods in the treatment of sterility. Occasionally success was reported. However, further experience taught us that this treatment was absolutely ineffective and that not infrequently it proved dangerous, because it spread infection in the genital tract.

The study of the influence of diet upon the development of the spermatozoa seemed for the time being to be very interesting. Observations were made on the effects of diet, restricted as to its quality and limited as to its quantity, upon the development and natural life of the spermatozoa. Subsequent investigations did not confirm some of the earlier observations, and it is now generally conceded that diet has no influence upon the development of the spermatozoa.

I believe that our knowledge of the life history of the spermatozoon

in its relation to impregnation and conception is very meagre. Once well-formed spermatozoa are found in the secretion of the male we must assume that he is capable of impregnating a woman, the mate in many instances may not necessarily have to be his wife.

The second group of investigators, or those interested in the female aspect of sterility, have had a more fruitful field for their theories, as to etiology and treatment. In no other branch of medicine were patients subjected to such unreasonable treatment as some women suffering from sterility.

The mechanical theory of sterility still has a strong hold on the profession. The result is that it is but a rare exception to find a woman who is sterile for any length of time who was not dilated and curetted one or more times. I need not point out what such procedures lead to, especially in women who have had a subacute or chronic infection in or about the pelvis. Very often the complications were such that no amount of surgical interference would cure the patient completely.

When surgical procedures in general became less hazardous to the patients simple dilatation was quickly replaced by methods which had for their purpose the permanent enlargement of the cervical canal. Accordingly, stem pessaries and tents of various sizes and shapes were invented and inserted into the cervix, and kept there from two to twelve weeks. It is surprising that even recently articles were published which gave the number of patients who were cured by such treatment.

Evidently the results of these simple procedures in the treatment of sterility did not prove very successful, for many cutting operations upon the cervix were invented. Some chose for their points of attack the posterior lip, others the anterior lip, and still others the lateral walls. More recently, however, operations have been devised which practically necessitate the removal of the greater portion of the cervical tissue, and the cervix, or what is left of it, is reconstructed according to the fancies of the individual operator.

I believe that the time has come when we should recount our experiences and seriously ask ourselves the question, whether these operations have ever cured any of our patients, or are we deluding ourselves by the occasional good result which apparently follows some of these procedures?

My experience may differ from that of many others but I am sure, now more than ever, that operations upon the cervix for the cure of primary sterility are absolutely useless, and that in a great number of cases they do more harm than good. I never saw a cervical canal which was too small for a spermatozoon to pass through. Once the

clotted particles of menstrual blood pass through the cervix the canal is roomy enough for the spermatozoa to travel up into the uterus.

I am convinced that the mechanical theory of sterility is purely a myth, and in practice it does not exist. The fallacy of this theory I was able to demonstrate since we instituted at Lebanon Hospital the routine examination for patency of the fallopian tubes in well selected cases, who suffer from sterility. I found that we succeeded in introducing a No. 6 Holzman cannula into the uterus in 213 patients of a total of 215 that were examined. Who will maintain that obstruction in the uterine canal existed in these patients, or that their sterility was due to some organic mechanical occlusion in the cervix?

During the last decade the study of the functions and secretions of the ductless glands has developed new conceptions of the physiology of the human body. Many mooted points have been clarified by the steady increase of our knowledge of the glands of internal secretion. Our conception of disturbed bodily function has been greatly changed. For a brief period of time it seemed that the entire foundation of the science of medicine would be shattered. The few fundamental principles which took so many years to develop were in danger of being destroyed.

It was at this time that sober reflection and honest effort to seek after the truth fortunately predominated, so that a proper equilibrium was maintained. Unfortunately some strayed afar, and, instead of critically examining the facts presented by the various investigators, were carried away by a wave of so-called "endocrinology." They practically commercialized the meagre knowledge in their possession and exploited it upon a credulous public. The attitude and behavior of some of these gentlemen were such that it almost bordered on divination. They conducted themselves as if they were really inspired by some superhuman power and that the rest were merely ordinary mortals.

It was but natural that such hysterical speculations should soon creep into the domain of gynecology. In this branch of medicine endocrinology became almost a cult. Miraculous cures, secret and otherwise, were held out to suffering womanhood. The woman who suffers from sterility from time immemorial has been an easy prey for all sorts of exploitations. Various combinations of organic extracts were concocted and prescribed for patients with the positive assurance that they would be absolutely cured.

I do not want to appear pessimistic, neither do I wish to offer criticism destructive in character, it is contrary to my natural inclinations. I probably would not draw conclusions about organotherapy were they based upon my own experience only. I might have thought that it was not given to me to understand the delicate and intricate

problems associated with endocrinology. I am prompted to arrive at these conclusions because of the careful observations I made on patients who were treated by some of our foremost self-styled endocrinologic gynecologists. I know that these patients were not cured by them, and that not only did they remain sterile, but also that their menstrual disturbances were not improved for any extended period of time.

During the past five years I used practically every standard preparation of the various organic extracts in hospital and private practice. I was especially interested to learn what effect they had on patients who suffered from primary sterility. I must confess my firm conviction that the organic extracts, as they are at present prepared, play no rôle whatsoever in the treatment of sterility.

During the twelve months preceding September 1 of this year 192 women consulted me for primary sterility. Most of these patients had consulted other specialists before they came to see me. The majority had had some operative interference, either by their family physician or by a specialist. The operations varied; some were dilated, others had one of the cutting operations on the cervix, a few were subjected to abdominal operations in order to correct uterine displacements or to repair diseased fallopian tubes; all of them received various combinations of organic extracts as an adjuvant to the operative measures. The results were equally unfavorable with all the methods of treatment. All but twelve patients never became pregnant, and the probabilities are that they will remain sterile, unless a new therapeutic agent will be discovered which truly will help these patients.

The average age of the patients in this series was twenty-eight and one-half years; the average period of time of marriage was six and one-half years; the shortest period was nine months, the longest seventeen years. Twenty-two per cent of the patients suffered from irregular menstruation, the intervals ranging from two to nine months. One patient stopped at the age of twenty and one-half years; she began to menstruate at sixteen years of age and menstruated very irregularly during that time. One patient began to menstruate at fourteen years of age and stopped at the age of twenty-three years. One patient ceased to menstruate as soon as she married, at the age of twenty-four years. She came to see me three years later.

Fourteen per cent of the patients suffered from dysmenorrhea. Many were compelled to remain in bed during their menstrual flow. Four per cent suffered from scanty menstruation and only spotted or stained for one or two days. One patient suffered from menorrhagia. Eighty-six patients of this series were examined for patency of the fallopian tubes. In 58, or 68.8 per cent, the fallopian tubes

were found to be open. In 27, or 32.2 per cent, the tubes were apparently closed. The percentage of patent fallopian tubes in this series of cases is somewhat higher than in our previous series. This may be accounted for by the fact that we probably have a better understanding of the technic of this procedure.

Transuterine insufflation of the peritoneal cavity with oxygen or carbon-dioxide gas, as developed by Rubin, is a very valuable aid in the diagnosis of sterility. We have no other method of examination which so clearly demonstrates the patency of the fallopian tubes. Once the patency is positively established the patient will no longer be subjected to exploratory operations on the mere suspicion that the tubes might be closed, as was the practice heretofore in a great number of cases.

This method of examination should be utilized in every case in which the cause of sterility is of doubtful origin. It is especially useful in those who have had one fallopian tube removed because of infection or extrauterine pregnancy.

Complications can be avoided if the patients are carefully selected. It should never be used in the presence of acute or subacute infections, or when the patient complains of pain in the pelvic region. We employed this method of examination 215 times during the past twenty months without any untoward complications; two patients developed acute pelvic infections, which subsided under palliative treatment.

The therapeutic value of this procedure must for the present be left in abeyance, although five of the patients did not menstruate after this examination, and subsequently were found to be pregnant. We believe that the entrance of gas into the tubes, under pressure, will expel mucous plugs from them and also straighten out any kinking which might have taken place along their course.

We now utilize transuterine insufflation during abdominal operations. In that way we are able to establish positively the patency of the tubes with the least amount of traumatism to their mucous membranes. We also employ it in patients who have had plastic operations on the fallopian tubes. It can be very readily performed during convalescence of the patient from the operation. The passage of gas under pressure through the tubes may prevent the formation of adhesions around the distal openings, and therefore closure of the tubes is less likely to occur.

A careful study of my patients clearly demonstrates that the percentage of sterile patients who are amenable to treatment is very small. The experienced gynecologist usually has no difficulty in properly interpreting the physical findings of the patient, especially when it is supplemented by a thorough history, the prognosis and

treatment can be established in nearly all the cases with a fair degree of accuracy.

As a general rule, women who suffer from primary sterility can be separated into three distinct groups. Exceptions undoubtedly occur. (1) Patients with congenital defects, which vary in degree from the total absence to the milder forms of malformation of the genital organs. Such women are incomplete physical beings and are beyond the help of all known therapeutic measures. (2) Women who apparently do not have physical defects of the genital organs, but suffer from disturbance of function of these organs. Usually it is shown by the changes which take place in their menstrual cycle. A great number of these patients suffer from dysmenorrhea, and do not have their periods at proper intervals; their flow is lessened or scanty. In these patients the sterility very often is temporary in character. Sooner or later some readjustment takes place and pregnancy ensues.

It is in this class of patients that we often ascribe to the treatment the successful outcome of the case. A great number of these patients would have become pregnant if they had not been treated; some might have required minor corrections as to their mode of sexual life; others would have had to have neutralized a highly acid vaginal secretion; and a few might even have had to change climate. That pregnancy finally takes place in a certain percentage of these cases, when not treated, I proved conclusively in a previous paper. (3) To this group belong all patients who are sterile because of mechanical obstruction of the tubes, which is caused by infection acquired during the marital state, or induced by inflammatory reactions of the genital organs which occurred during an infectious or contagious disease in infancy or childhood. Not infrequently closure of the tubes can be traced to an extension of the process of specific vulvovaginitis in young children.

Fortunately we have now a method by which we can definitely ascertain whether the tubes are open or closed. It is surprising to find the number of young women whose tubes are closed and who have no immediate history of infection of the genital tract.

Plastic operations on the tubes in these patients heretofore did not cure many. Pregnancy ensued in less than 15 per cent; the others remained permanently sterile. Partial resection of one or both tubes will often rob the women of any possible chance for future pregnancy, as the postoperative reaction in the pelvis after such an operation is, not infrequently, very severe and causes great damage to the genital organs.

I am fully aware that a great many will not agree with the views I have presented in this paper. I have made an honest effort to study my patients very carefully and I am stating the experiences from my

own practice and also from patients who have been treated by many of the leading gynecologists of this city.

I am certain that we must discard our present methods of treatment of sterility because they have been erroneously conceived. The sooner we older men in the field of gynecology admit defeat the sooner will the younger generation of specialists wake up to the fact that upon them rests the responsibility of the solution of a problem which will bring salvation to so many ill-fated women.

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DISCUSSION

DR. ROBERT T. MORRIS, New York City.—Dr. Rongy brought out the fact that a narrow internal os or an obstruction of that sort is of very little consequence, so far as the passage of spermatozoa is concerned. After opening the cervix by dilatation there have been, however, a number of pregnancies reported, and such results cannot be put aside. The results to my mind mean this. You change temporarily in some cases the character of the secretions. For instance, in some instances of sterility, you find a highly acid secretion, and dilatation or insertion of the stem may change the relative acidity, thereby favoring pregnancy.

Dr. Rongy did not tell us what he did in the case in which he had excluded everything and finally found closed tubes. In one case I found the tubes closed congenitally and short circuited one closed tube by grafting the ampulla up into the cornu. I had so little faith because of the delicacy of the structures in this case that I only did it on one side. This patient has since had two children, one of them very defective.

Dr. Rongy did not tell us what to do in the gonorrheal cases. He speaks of permanent sterility. That is not so. Usually, if you incise a clubbed tube, with nothing normal left in sight, plugged, ragged, bleeding, and split it lengthwise to the cornu, leave it wide open, and go in at the end of three months later, you will find fimbriae that you had not expected. You can make these patients have an open tube. If the tube is closed by scar tissue, split it, leave it wide open, and when you go in at the end of two or three months, three-fourths of the tube may be quite round and patent. If such patients are given gonococcus vaccines for six months or a year, after saving the tubes, they are likely to overcome the sterility. I would not call these "permanent sterility cases."

DR. JAMES N. WEST, New York City.—I would say that the usual classification of sterility is primary and secondary. Primary sterility is a condition of azoospermatism, that is, the subject has not secreted the proper germ, in the female, the ovum, in the male the spermatozoon, an entirely different thing from the chief subject of this discussion. It would seem that the paper and most of the discussion refer to secondary sterility. Primary sterility is not present if the patient is capable of secreting an ovum, but all sterility which is due to tumors, displacements, lacerations, or other mechanical causes, is secondary. As a matter of fact, I can say to Dr. Rongy that I think I have cured several cases of long standing sterility by amputation of the cervix, at about one-third of an inch below the internal os, this operation allowing the uterus to straighten itself out, the canal remaining open to the spermatozoon.

In regard to chemotaxis which exists, affinity between living fluids, it is beautifully and delicately arranged by nature. The vagina has a natural acid secretion which when mild stimulates the action of spermatozoa, whereas in the uterus the secretion is alkaline. A mildly alkaline solution favors the life of spermatozoa,

so that if we have an endometritis and an excessive alkaline secretion we may destroy the spermatozoon before it has had time to come in contact with the ovum. If in the vagina there is an excessively acid secretion, it may overstimulate and destroy the activity of the spermatozoa. Normally a woman is balanced.

I have seen a case in which a couple were married a number of years and no conception took place. Trouble occurred and a divorce obtained. These people married, and each one had children afterward. This suggests the possibility of some biologic law which effects sterility in some cases.

DR. CHARLES L. BONIFIELD, CINCINNATI, OHIO.—I cannot quite agree with some of Dr. Rongy's conclusions. In the first place, I do not believe that sterility has not been cured by dilating the cervix and curetting the uterus. It happens too often to be a mere coincidence. How does it act? Dr. West has said what I wanted to say. It is this: It is not that the pin hole os is too small for the spermatozoa to get through; of course not, but the cervical canal is too small for the uterus to drain its own secretions, and as a consequence of that lack of drainage endometritis develops, and that is the cause of the sterility. A woman begins to menstruate at the age of 16 or 17, without much difficulty, although a little scanty at the time. She may have been menstruating for three years and then she gets an intense dysmenorrhea. What does it mean? It means the cervical canal is bent, and the mucous membrane becomes swollen, the secretions of the uterus do not get out, she develops endometritis, and that is the cause of the dysmenorrhea. Another fact to be borne in mind is that oftentimes by dilatation and gentle curettage we can stimulate the uterus to function better. I well remember a case, a Sister of Charity. Sterility had nothing to do with the case, but this woman was under my care for fifteen years, and she would get so that she could scarcely menstruate at all. Menstruation was very painful. I would dilate the cervix, pack the uterus with gauze, and put her through a miniature labor, and for three years she would menstruate freely; then I would perform the operation again. I did this until she developed a fibroid, then I removed the uterus.

DR. H. WELLINGTON YATES, DETROIT, MICHIGAN.—It may be possible that at some future time we will be able to type patients before they are married. However, it seems to me that it does not depend so much upon a crooked path of the canal as it does upon endometritis, so-called, or upon endocervicitis. I do not believe endometritis exists as such very long. Endocervicitis is a different thing, inasmuch as the compound type of glands do not rid themselves of the discharge, which is definitely the inhibiting factor.

I was interested to know how Dr. Morris had effected a cure of these cases by splitting these tubes from their ampullar end toward the uterus. I think it is the experience of many men that the closure is not at the ampullar end, but very often in the isthmus or at the proximal end of the uterus, or in that proximity, and merely splitting the tube up to that surface will not suffice in perhaps more than 50 per cent of the cases.

I was interested also in a remark by the essayist, if I understood him correctly, namely, he had passed a tube in 200 cases from the ampullar end of the tube down to the uterus. All the cases we have had in our service of late would admit but a small probe, for about two or three centimeters from the uterine end there is a kink which was normal to the tube and did not admit a probe under normal conditions.

DR. GORDON K. DICKINSON, JERSEY CITY, NEW JERSEY.—The Fellows have been talking about the womb, and forgotten the woman. In some foreign countries the males are males, and the females are females, but wherever there is civilization, there is a betwixt and between type which I call the physiological hermaph-

rodite, and this is quite common. They begin to menstruate late and reach the menopause early. They never do anything, that primitive women ought to, and they do not have babies right. Very often it is not until late in life they get their first child.

I operated on a woman, not long ago, in the fifties, who had had her changes, and she had a myoma with the first baby, so these cases are misleading. I think some of these women know they are in that condition because of some defect of the internal secretions. We used to say there is something the matter with the nervous system. If they have sick headaches, we feel that there is something the matter with the internal secretion. There is something not in the books. One of the most potent secretions we have is the ejaculation in the woman's vagina. Everybody knows the vagina is a fine absorbing organ. Many a woman is killed by a 1-1000 douche of bichloride. I feel quite positive there is considerable absorption of the highly vitalized secretion through the vagina. Every one knows that a woman changes after marriage. You can always tell an old maid from a married woman. That may account for the fact that in time comes along a child. It does look as if there is something in the type business, because I have read and known of people, as the doctor said, having babies later from a second wife or second husband. But there is one thing concerning which I want to go on record, namely, the way women become pregnant against pretty tough circumstances. You may remember I read a paper before this Association a few years ago on "Fundal Resection of the Uterus." I took out a piece to put at the top of the uterus on each side, the lines meeting just above the internal os. I cauterized the cervical stoma, also the tubal, and brought them together. There were three or four centimeters of raw muscle tissue brought flap to flap. I have done that in a number of cases and have had two pregnancies, one quite recently, four years after the operation. The other came on inside of twelve months after the operation, so that there is something I think in what you may call the type business, but there is also something in the intense energy, the dynamic energy of the woman and the man.

DR. JAMES E. DAVIS, DETROIT, MICHIGAN.—May I call attention to a small percentage of cases that are due to delayed or arrested development of the oviduct. You will all recall that the oviduct, when undeveloped, has a number of fairly definite kinks or waves in its course. In a certain percentage of cases this anatomical condition is carried over into adult life. When that is the case, the circular muscle layer is thick, not only at the proximal end, but practically throughout the entire length of the tube. The normal disproportion between the circular layer and the longitudinal layer does not develop. This should obtain toward the distal end in order to insure the normal function of propulsion.

What Dr. Morris has said relative to the ability of the oviduct to recover after gonorrheal infection is very true. The ability to recover is wonderful. I called attention to this remarkable repair in a former paper. After a rather extensive microscopic examination of a large number of oviducts, I was able to observe the repair process in the different stages, and it seems simply wonderful how frequently the tube can repair. Only after streptococcic infections is this ability to repair frequently and seriously impaired.

DR. DAVID W. TOVEY, NEW YORK CITY.—There is no doubt the endocrines help to make a woman who has irregular menses, regular. There is no doubt, furthermore, if we can get a woman who has been irregular, and can get the menses regular, by stimulation of the ovaries, she will sometimes become pregnant. I believe in the case Dr. Dickinson spoke of, where the woman became pregnant late in life, it was due to the development of the uterus by the stimulation from the ovarian secretion.

I thought years ago that endometritis, had come to be known as a rare disease. Some years ago at the Johns Hopkins Hospital they took scrapings from all uteri

that were removed, or curetted, they were examined by the pathologist, and it was found that endometritis was very rare. I think in those cases that become pregnant that are dilated and curetted, it is the dilatation that helps. Curettage is only harmful, especially if done thoroughly. It should never be done except for retained secundines, or for diagnosis.

DR. STEPHEN E. TRACY, PHILADELPHIA, PENNSYLVANIA.—We know so little about this subject that every recognized fact should be brought out. A certain number of women with a deep vagina do not conceive. After intercourse the fluid runs out and never reaches the cervix. A certain percentage of these patients will become pregnant if they have intercourse in the knee-chest position soon after the menstrual period. There is a class of women who do not have intercourse before eight to fourteen days after the menstrual period and they do not conceive. Many of them will prompty become pregnant when they have intercourse soon after the menstrual period. Some women do not conceive because of improper method of coition. When a patient comes complaining of sterility, a most careful detailed history, including the sexual habits, should be taken. Before any operation is undertaken on these women in the absence of pelvic pathology or anatomical abnormalities, the husband should be examined. There are thousands of these women subjected to unnecessary and useless operations.

DR. WILLIAM PFEIFFER, BROOKLYN, NEW YORK.—I wish to make an urgent plea for conservation of the tubes. Curtis has shown definitely that the gonorrheal tube, if infection is not accompanied by the streptococcus or staphylococcus, sterilizes itself quickly. The streptococcus may remain latent in the tube for two or three years.

I delivered a woman this spring who had had a tuboovarian abscess removed from the right side, the left tube did not then appear to be in good condition and I was tempted to remove it, but bearing in mind her desire for maternity, I left it. The woman subsequently developed quite an enlargement of the left tube and I advised its removal, which was refused. It was a gonorrheal tube which healed in a mysterious way. Conservation of tubes is to be practiced except in the presence of abscess.

DR. WILLIAM M. BROWN, ROCHESTER, NEW YORK.—I would like to raise the question of the possibility of local tuberculosis being often an unrecognized source of occlusion of the tubes.

DR. HUGO O. PANTZER, INDIANAPOLIS, INDIANA.—I would like to ask the essayist how he reconciles the diversity of opinion in regard to sterility. Spencer in the initial chapter of his book says there is a kernel of truth in every system of philosophy. That applies here. There is a kernel of truth in the different theories expounded in regard to sterility, and I think we have reason in the individual case to differentiate and then apply the remedy.

DR. RONGY, (closing).—In a paper on sterility, which is shortly to be published, I have covered almost every phase of the discussion that has taken place here, including the "donor law," as mentioned by Dr. Heyd. We have taken a series of sterile women and their husbands and have typed them, and we also took a series of patients from the obstetrical ward and their husbands and typed them. We found that there exists practically no difference in the blood groupings in those women who are sterile and the women who have borne children.

With regard to the testing of the vaginal and cervical secretions, that has been carefully studied by my associate, Dr. S. S. Rosenfeld.

As to the statement, made by Dr. Morris, that we can expect good results in 15 per cent of the cases who have had plastic operations performed on the fallopian tubes, I will admit that this high percentage of good results may be true of the

patients operated upon by Dr. Morris or equally good surgeons. But, if one watches some of the plastic operations, which are performed on the fallopian tubes for the cure of sterility by some of the surgeons in New York, he will not at all be surprised why the results after such operations in the hands of the average surgeon are not so good.

Dr. Bonifield convicted himself when he said he curetted a woman for dysmenorrhea, and that the same patient later developed a tumor of the uterus.

DR. BONIFIELD.—The dysmenorrhea was not due to endometritis.

DR. RONGY.—In that particular case, surely, it was not the endometritis that caused the dysmenorrhea. When a woman has dysmenorrhea and later develops a fibroid, it shows there is something wrong with her constitutionally. The dysmenorrhea is usually of ovarian origin, and in your case, Dr. Bonifield, her dysmenorrhea was undoubtedly of ovarian origin, caused by the fibroid.

Dr. West raised the question whether there is such a thing as primary sterility in women. I feel that primary sterility may be due either to the male or female. Regarding his statement as to the amputation of the cervix, I remember very well about 15 years ago, when it was the custom to amputate the cervix for the cure of primary sterility. I also remember a number of these patients, who became pregnant and aborted.

When I spoke about inserting a cannula through the cervix into the uterus, I had reference to a Holzman cannula, and I maintain that when one can pass a No. 6 Holzman cannula through the cervix with comparative ease, an obstruction in the uterine canal does not exist in these patients and the patient is not suffering from mechanical obstruction in any part of the uterine canal, which would cause her to be sterile.

I think Dr. Dickinson touched on a very important point in the use of contraceptors. All of us have had patients, who have prevented pregnancy for a number of years and when they wanted to become pregnant they could not. The changes produced in the vaginal mucous membranes by these contraceptive medicines, whether it is bichloride, resorcin, or quinine, were such that it interfered with the proper function of the vaginal mucous membranes; very often these patients come to us for advice, and tell us that they have stopped the use of contraceptives and still do not become pregnant. I am sure this is due to the changes produced by the various chemical substances, which these contraceptive agents are composed of.

Dr. Tracy mentioned a case of a couple, the husband being a Columbia and Harvard graduate, who did not know the proper way to have sexual intercourse. To my mind this is a reflection on the education given at these universities, and it really needs no further comment. Regarding intercourse in the knee-chest position, I pointed that out in an article I had published in 1911.

As to the sexual history of the patient, I think that must be thoroughly studied, for very often a great amount of knowledge may be derived from a real analysis of the sexual history.

I do not agree with Dr. Tovey. I never saw a patient benefited by any of the organic extracts for any length of time. They may improve temporarily, but the menstrual disturbances usually recur, no matter how much of the organic extracts we might have given them.

There can be no question but that tuberculosis of the tubes plays a great rôle in the etiology of sterility. Only the other day I operated on a patient; I found the tubes patent, but very much thickened. Sectioning of the removed part of the tube disclosed that the woman suffered from genital tuberculosis. Tuberculosis of the genital organs is more frequent than most of us surmise.

THE CERVIX A FOCAL POINT OF INFECTION

(With a Unique Case in Illustration)

By G. K. Dickinson, M.D., F.A.C.S., Jersey City, N. J.

ABERNETHY, that original surgeon of a century ago, was chided because, in a lecture before the Royal College of Surgeons, he chose as his topic, "The Greasy Poultice." Perhaps the selection of a trivial subject like the above may invite criticism, but it is hoped some points which have been neglected may be brought out for illumination.

Previous to Emmet's time, little note was given to the cervix and its pathology, but his masterly work drew attention to cervical lacerations, created for a while some scientific interest, and led to deductions at least of temporary value.

The profession having had its mind so largely on the major pathology of the pelvis, the comparatively insignificant lesions of the cervix have been neglected. This organ has been termed the neck of the womb. By some it has been considered a buffer; by those of mechanical mind, a part of the leverage system of the uterus; by others, but a passageway for the flux and the sperm.

The cervix is developed from the second part of Müller's duct, independently of the body formed in the first part. Later the two are joined, the juncture, the internal os, being a physiologic barrier to invading germs. Histologically, it is more largely composed of circular muscular fibers and lined by a mucosa, containing funicular glands and ramifications. These glands secrete mucus. Thus we see that the cervix is an independent organ, embryologically, histologically and physiologically independent of, but correlated with, the uterine body.

The lymphatics of the mucosa begin as open spaces around the gland cells, which open into the lymph channels, some to pass directly to the parametrium and others connect with those in the body of the uterus, giving free passage of their content, normal or pathologic, not only directly to the region of the adnexa, but to the tissues of the corpus.

Whether through traumatism, or possibly through the blood stream, the cervical mucosa may become infected and inflamed. Various microorganisms have been discovered: colon bacilli, streptococci, staphylococci, and gonococci. The relation of the cervix varies with the type of germ. The streptococci and staphylococci generally pro-

duce acute conditions. In the majority of instances, their life is short. It is said that the chronic type of endocervicitis is seldom the result of their invasion. Perhaps a local immunity has been acquired to them from long association. The cervix does not seem able to immunize the gonococcus, a germ of communal life and of more recent introduction. It will remain in the follicles, saprophytic, for an indefinite time. Its tendency is to bring out fibrin, inducing a more chronic type of inflammation with hyperplasia and thickening.

Germs and toxins are disseminated through the lymph stream, generally bilaterally. Incident to the lymphatics that pass through the body of the uterus, a hyperplasia is induced, fibrous metritis, so-called, with resultant phenomena and symptoms, namely, hemorrhages, dysmenorrhea and sterility. The lymph channels which carry towards the adnexa may determine parametritis and infections of the fallopian tube and even the ovary.

The symptoms of endocervicitis, *per se,* are difficult to determine because of commonly associated and complicating pathology. We can recollect, however, in the days when trachelorrhaphy was so commonly done, before the major pathology of the pelvis had been recognized and exploited, that those who had a simple repair, thereby a reduction in the amount of infected mucosa, obtained considerable relief from disturbing symptoms. There was a lessening of backache, the uterus would diminish in size, thus giving relief from drag. Menstrual irregularities would be bettered. Perhaps, to a certain extent, our enthusiasm was taken up by the patient with a psychologic effect.

The operation recently exploited by Sturmdorf and others, whereby the mucosa alone is dissected out, provides a way of determining more exactly the relation of endocervicitis to the symptomatology of the patient and a better guide for estimating the value and necessity of such operation from a clinical standpoint.

To Rosenow, also, are we obligated, for the cervix uteri has been compared to the tonsil, perhaps with good reason. The tonsil contains lymphatic tissue. It is in a position to stand the brunt of a larger number of microbes, as well as changes in atmospheric conditions; nevertheless, the mucosa of the cervix, even though relatively secluded, in its crypts and its comparatively sluggish circulation, possesses the possibility of harboring such germs as may reach it.

Germs developed in regions highly vascular, of plentiful oxygen supply, are prone to produce active processes when disseminated through the body. They are inclined to locate only in organs well supplied with blood, which would permit of active pathology. Germs which have developed in organs less vascular, where the oxygen is not abundantly supplied, when disseminated incline towards tissues poorly supplied. Hence, the germs which leave the cervix do not

give active lesions in important organs, but find their contentment principally in the fascias with vague symptoms.

Those who have made an intensive study of their patients for focal infection, who have removed teeth, tonsils, appendix, gall bladder and colon, have occasionally given relief by attention to the cervix. We have in mind, one case which will demonstrate with emphasis the occasional importance of this organ in the mighty problems of the body:

Mrs. C. H., para ii. Five feet in height, normal weight one hundred twenty-five pounds. Quick mentality, doing her work well. Thyroid not easily palpable; laryngeal rings rather prominent. Skin inclined to dryness. In March, 1912, developed an urticaria. Just before each exacerbation she had an indefinite earache, left side. Shortly, anorexia supervened. Not only was there loss of appetite, but food was distasteful. Then insomnia. She was referred to a competent ear specialist who found no defects. For six weeks she was under the care of a leading dermatologist who recommended the mountains, without relief. During the writer's absence in Vienna for the summer months, she advised with an internist, who diagnosed stomach trouble. Then an abdominal surgeon, who treated her for intestinal fermentation. Next to an obstetrician, who said she was in the change of life. From him she went to a neurologist, who told her it was nerves.

On the writer's return, September 1, she was referred again to one of the leading skin specialists in New York, who put her on a diet of sour milk. By x-ray he found a ptosis of the stomach and advised operation, although he could promise no cure. This she declined, and then consulted a leading internist who called it a type of rheumatism. Next to another dermatologist who gave her salves and put her on a milk diet.

By this time she was a pitiful specimen, having fallen from her normal weight to ninety-eight pounds, markedly emaciated, extremely nervous from constant itching, loss of sleep and abstinence from nutritious food. It did not seem as if anything would be of avail, and, like a severe neuritis, time would wear her out and prove fatal from exhaustion and starvation.

This brings us around to May, 1913, when she reported suppression of menses for two months, with distress in the uterus. Feeling that at least she could be relieved of this, we had her come to the office and with a sharp curet the mucosa of the cervix was thoroughly scraped, hoping thereby to induce a flow. This was successful, flow coming on and lasting five days. But the unexpected occurred. Four hours after the curettage, her earache started and she then had the most severe attack of itching and wheals she had ever experienced. For twenty-four hours it raged, then subsided and the third day had entirely disappeared. That was on May 16. Until May 28, she was entirely free from her distress, there was no itching, hunger returned, she ate freely and contentedly, insomnia disappeared, and her body filled out. On May 28, she was again seized with the hives, preceded by pain in the ear. Empirically, we again curetted thoroughly. An exacerbation followed the curettage, but within twelve hours it had all disappeared. She could sleep and had no trouble whatever until December 20, 1913, when she went over her regular time a few days. The itching recurred mildly. Curettage completed the cure.

To us this is a very evident case of focal infection. Not thinking there was any relation between her cervix and her miserable condition, no particular study was made of the endometrium. The cervix was

not hyperplastic, she had no laceration, the mucosa was not exuberant, nor of abnormal appearance; in short, there was no endocervicitis as ordinarily recognized. The stirring up of a local condition by the curettage led to an active absorption and exacerbation of symptoms.

Résumé.—The cervix is a definite organ with a distinctive function. As a portal to the endometrium it allows passage of Nature's fluids. It also picks up and carries into the recesses of the mucosa bacteria, where they are either destroyed or become saprophytes.

Harbored microbes may inflame the cervix and through the lymph stream cause more or less regional reaction, or, by the blood stream a varied expression.

The cervix may act as a focal point for infections.

280 Montgomery Street.

DISCUSSION

DR. H. WELLINGTON YATES, Detroit, Michigan.—Interest in the paper lies in local infection disseminated in this way and giving rise to general symptoms. It is interesting, inasmuch as we have had very little of this particular section of the genitourinary system called to our attention as a cause. Were it not for the fact of one or two repetitions of the maneuver he practiced, I should question whether or not the whole thing was not coincidental.

The question of operation and what should be done with many of the cases of endocervicitis is always of interest. It seems the female mind is so easily impressed by anything which we do that we should put on the soft pedal in general in questions of operation unless there is a very definite cause for it. People who have receptive minds, as most women of this type have, are easily misled and easily brought to the point in which any kind of operation would be welcomed.

MALFORMATIONS OF THE UTERUS AND APPENDAGES

With a Report of Six Cases

By Arthur T. Jones, M.D., F.A.C.S., Providence, R. I.

MALFORMATIONS of the uterus, appendages, and vagina are dependent chiefly upon some fault in the normal development and fusion of the ducts of Müller.

In the normal course of development the upper portions of the ducts of Müller, although separate, converge, forming the fallopian tubes; the middle portions fuse, and the partitions between them disappear, forming the uterus, while the lower portions by similar fusion and absorption of partition, form the vagina. Any interruption in this normal fusion and development may leave more or less of a double canal in the uterus or in the vagina, and depending on the equality or inequality in the development of the two halves, there may result, either a symmetrical double uterus and vagina or one-half may be well developed while the other half may present all grades of development from zero to perfection.

There are rare conditions of absence of the uterus, and rudimentary uterus, in which the latter organ is represented only by a band of connective tissue posterior to the bladder. For pregnancy to exist, at least one of the ducts of Müller must have developed sufficiently to form a serviceable half of a double uterus and vagina. There are many varieties of malformations most common of which are: 1. The uterus unicornis, in which only one duct of Müller is developed. 2. The uterus bicornis, in its various forms, in which both ducts are equally developed but there is fault in normal fusion and absorption. 3. Uterus bicornis in which one duct is imperfectly developed and has no connection with the vagina. 4. The uterus didelphys in which the halves are separate throughout. 5. The uterus septus, in which externally the uterus feels normal, but the partition between the middle portion of ducts of Müller has never absorbed. 6. Uterus bipartitus, in which both uterus and vagina are double and lie side by side as separate tubes. 7. Double vagina, in which fusion, absorption and development of the ducts of Müller are normal until the vagina is reached and here a partition is left dividing the vagina throughout more or less of its length. In any of the above mentioned, pregnancy may take place.

Several types of abnormalities of the uterus and appendages together with vagina or abnormalities of any one respectively have been described, among which may be mentioned double uterus with

double vagina; congenital absence of uterus and vagina; absence of uterus both tubes and right ovary; double vagina plus double cervix; absence of vagina and uterus; double solid uterus; double lumen in fallopian tubes; congenital absence of uterus alone with tubes and ovaries present; and congenital absence of uterus with anomalous vulvovaginal anus.

The following cases which have come under our observation are of particular interest due to abnormalities presented:

Case I.—I. P., female, age twenty-six, white, married, complaining of a tumor which she discovered following her last miscarriage. Patient had one child three years ago, two miscarriages, last one about two months before she was seen by me. Menstruation regular. Examination showed a large cystic tumor in pelvis, which pushed the uterus well over to left side. Cervix small and high up. Diagnosis of ovarian cyst was made. Patient was operated on August 26, 1915, at which time a cyst of the right ovary was found the size of a grapefruit. The cyst and tube were removed, it not seeming feasible to attempt to save any portion of the right tube because of the pathology attached to it. The left side of the uterus was found to be perfectly smooth and with no appendage. The left round ligament was inserted into the uterus below the junction of the cervix with the body of the uterus. Further examination revealed an ovary twice its natural size and a tube one and one-half inches long on the left pelvic wall attached by the broad ligament. The left tube was cut across and the cut end split up a distance of one-fourth of an inch for transplanting into the uterus. The end of the right tube was excised from the horn of the uterus and incision carried inward opening into the cavity of the uterus. The left tube was then transplanted into the horn of the uterus at this point. Two strands of No. 2 chronic gut were then passed through the tube into the uterine cavity with the ends protruding from the tube to keep the same patent where it was grafted into the uterus. The left ovary which then lay close to the uterus and on top of the round ligament was sewed to the round ligament closing the opening, which would predispose to ileus. The patient made an uneventful recovery. Two years after operation the patient reports menstruation regular every four weeks, not painful, moderate amount for four days. No pregnancies since.

Case II.— G. N., female, age twenty-four, white, married for three and one-half years. No pregnancies. Nothing abnormal in regard to her menses. Examination revealed an ovarian cyst. At the time of operation, May 19, 1915, a cyst of the left ovary was removed. At the left of the uterus was a small mass which at first looked like a fibroid the size of a walnut. The left tube and round ligament, however, came off from this left horn of what was really a bicornate uterus, the left side being much less developed than the right. This supernumerary uterus was removed. The round ligament was tied and cut away and then sewed to the horn of the uterus proper. Beneath the supernumerary uterus where it was cut across was a slight area of thickened tissue apparently a small mass of uterine tissue simulating a cervix. The patient made an uneventful recovery.

Two years later the patient was delivered of a baby girl. This child was seen in consultation about five months after birth and was a Mongolian idiot. Patient has since given birth to a normal healthy infant.

Case III.—C. W., age thirty-four, white, married five years, menstruation normal. Had one miscarriage at two months. Patient had been delivered of a six and a half months fetus two weeks before first seen. Four days before labor she complained of pain in her left side, also noticed a tumor following her delivery. Ex-

amination showed presence of large tumor in left side of abdomen and pelvis, apparently connected with the uterus. The uterus seemed small however. Diagnosis of a tumor made. When operated, April 10, 1920, which was twenty-six days after delivery, the tumor mass was found to be the left horn of a bicornate uterus and was the size of a coconut. A definite sulcus seemed to divide this horn from the right side; the latter seemed about the size of a normal uterus. The transverse colon was adherent to the left horn of the uterus where the latter had perforated. Nature had closed the opening by causing the colon to adhere at this spot. Upon separating the adhesions the perforation was found in the uterus and a dark grumous discharge came from the cavity of this uterine horn. The entire right side of the uterus was removed along the dividing sulcus. Examination of the removed left horn showed the mucous membrane very dark, grumous looking and thrown into heavy folds. It was evident from the gross appearance, that the pregnancy had occurred in this horn, which had failed to involute and the ulceration had occurred at the fundus where Nature had temporarily taken care of it. A pathologic examination showed an excess of fibroid tissue but nothing else abnormal.

Patient made an uneventful recovery. She was seen within the last few months and is in excellent condition. No pregnancy since operation April 10, 1920.

Case IV.—B. S., white, age thirty-five, seen in 1911, suffering from a tubo-ovarian abscess. Although married for several years she had had no pregnancy. On examination of her pelvis it was found that a double vagina was present and apparently a double uterus for there was a semblance of a cervix in both sides. This patient declined operation and passed from under my observation, so I was unable to get further knowledge regarding her congenital malformation.

Case V.—M. A., female, white, and single. Operation on December 14, 1907, at which time a curettage, celiotomy, salpingo-oophorectomy, appendectomy and a plastic of the left ovary was done. At the time of the curettage an os was found, which presented in the right side of the vagina, and communicated with the right side of the uterus. The tissues about the os seemed soft and like vaginal wall only. A cervix was also present in its normal position and felt normal but was covered with vaginal mucous membrane and presented no os. At the time the celiotomy was done the mass in the right side proved to be tube and ovary of a cystic nature and appendix all matted together. The appendix was removed, right tube and ovary freed and removed. The left ovary was cystic and a plastic was done on it removing about one-half. The uterus was found to be bicornate and symmetrical on both sides.

Case VI.—A. A., age thirty, white. First seen in January, 1919. Married four years, child three years of age, instrumental delivery, following which the patient was in bed seven months suffering from phlegmasia alba dolens and other complications. She complained of heaviness in pelvis and dragging sensations. Menstruation every 28 days, not painful, five days, moderate amount. Examination revealed a small laceration of the cervix and perineum and a marked cystocele. A dilatation and curettage, trachelorrhaphy, anterior colporrhaphy, perineorrhaphy and celiotomy done. Upon opening the abdomen a condition of congenital absence of right ovary and tube was found and a condition of hydrops of the left tube. Plastic operation was done on left tube. The distal end was opened and a new fimbria made by suturing around the slit in tube with fine chromic gut. Patient was discharged well in eighteen days.

The conclusion we can draw from this review is a plea for conservatism and operations of a plastic nature to be resorted to rather than a complete removal of the female organs of regeneration. We

should watch for uterine malformations, which constitute an actual clinical group and whose management requires conservative surgical judgment.

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131 Waterman Street.

DISCUSSION

DR. HERMAN E. HAYD, Buffalo, New York.—I have had one interesting experience which occurred some years ago, to add to the doctor's paper. The patient was a young woman who had been previously operated upon for a chronic appendicitis, and I saw her three years afterward. She complained of backache, constipation, and considerable pain during menstruation, in fact, the usual symptoms associated with a broken down, invalided young woman. I made an examination through the rectum and at once diagnosed a retrodisplacement. I told her, that a more careful examination could be made under anesthesia, at the time of operation. I curretted and proceeded then to open the abdomen and found a very interesting situation. There were very dense adhesions as a result of the previous appendix operation, so much so, that scissors had to be used freely in order to separate the tissues and leave a sufficient amount on the bowel to protect it from injury. I found an absence of the left tube and ovary, in fact, the left side of the broad ligament looked like a sickle. Of course, it was not possible to do an intraperitoneal shortening with only one ligament, so I fastened the uterus forward and she made an uneventful recovery. In the course of three or four years, she developed a swelling on the left side, which at operation was found to be an inguinal hernia with the left tube and ovary in the canal. The case is interesting from a congenital and anatomical standpoint and secondly, from the deductions which can be made from the failure of the first operation. All women, married or single, should be examined *per rectum* or *per vaginam* before undergoing an operation for appendicitis. If an operation for chronic appendicitis is to be performed, then the incision can be made through the center of the abdomen, if there is any reason to be suspicious of any uterine or ovarian trouble, and both conditions can be corrected. I have known many cases where if this precaution had been taken, it would have prevented the necessity of a second operation for pelvic trouble as in this case.

DR. DAVID W. TOVEY, New York City.—I know of one instance where a diagnosis was made of fibroids with incomplete abortion at three months, and the physician curetted a hole to the size of a silver dollar through the center of the septum between the uterus bicornis. As you will recollect, the nonpregnant side of the uterus always enlarges during pregnancy in these cases of double uterus.

In another case where there was pregnancy on one side with double uterus, she had had babies from both sides. There was a single vagina. In that case there was an ectopic, and it was easy to remove one horn and leave a normal uterus.

DR. RUFUS B. HALL, CINCINNATI, OHIO.—I have seen quite a number of cases where the conditions were recognized only at the operating table. One patient was a young girl seen in consultation, well developed, about fifteen or sixteen years of age with a history of regular, normal menstruation. Gradually, for the last year or so, she had more pain than usual, and during this particular menstrual period, after a day or two of pain the family doctor was called and treated her for two days. She had a pulse of 150, a temperature of 104°. The hymen was intact and rectal examination demonstrated a tumor filling the pelvis completely, and extending half the way up to the umbilicus. I did not suspect the real cause of the difficulty, but as I opened her abdomen I discovered a double uterus. The tumor was one-half of the uterus filled with menstrual fluid. She had developed a general peritonitis. I immediately closed the abdomen, put her in the lithotomy position, and with some difficulty from below I was able to locate where the cervix should be, and with the point of a sharp scissors entered into the uterus then with uterine dilator, enlarged this opening and emptied the uterus. The girl made a prompt recovery. She married, and became the mother of three children and had no trouble from the three confinements.

DR. MAGNUS A. TATE, CINCINNATI, OHIO.—I desire to present a case that came under my care about three years ago, a young girl, 15 years of age, who suffered intensely from dysmenorrhea, was backward in her school studies, and associated with children about twelve years of age. The doctor had treated her for six months without any alleviation. She was sent to the Good Samaritan Hospital, put under an anesthetic and we found a double vagina and two cervices, and one uterus which deviated to the left. I naturally thought at first that she also had a double uterus. A sound was placed through one cervix into the uterus, but in the other cervix it would only go about one inch. We dissected off the blind cervix and the vaginal partition. The dysmenorrhea did not improve. A year following that, she had an acute attack of appendicitis. I operated, removed the appendix, and on examination found both tubes and both ovaries to be perfectly normal, the uterus was tilted over to the left side, but there were no adhesions. Since the removal of the appendix, she has improved much in general health, and the dysmenorrhea is not so pronounced.

IS SUPRAVAGINAL HYSTERECTOMY EVER JUSTIFIABLE?

By J. Wilson Poucher, M.D., Poughkeepsie, New York

UPON reviewing the end results of a large number of hysterectomies performed during a period extending over more than thirty years I find that the most frequent cause for regret in my whole series is due to the fact that here and there, I find a case where for one reason or another, a complete hysterectomy was not done, and where later the cervix which had been left behind had become the seat of malignant disease, with very serious results. I believe that my experience has also been the experience of most surgeons and gynecologists and I am aware of the fact that fewer and fewer supravaginal hysterectomies are being done every year.

It is a well-established fact that the cervix, being the most exposed part of the uterus, subject as it is to the violent abuses of child bearing, stretching, bruising lacerations, as well as being exposed to numerous infections, is the site of perhaps more cancer than any other portion of the human body. Should it ever be left remaining when its removal is only a matter of a few minutes added to the time of the operation, and where leaving it behind is a menace to our patient, during the rest of her life? Besides the danger of later development of malignant disease, there are other conditions that are sometimes very annoying to the patient. If any of the mucous membrane is left there is always the likelihood of a subsequent cervical leucorrhea which will give the patient some concern and if, as is quite frequently the case, the menopause is not passed, there may be a more or less regular menstrual flow from the remaining portion of the cervical canal. This has happened in at least two of my patients, the first one of which, I admit, gave me about as much concern for a time as it did my patient, for I could find nothing in the literature at that time to explain it. This condition I later on avoided in my supravaginal hysterectomies by coning out all the mucous membrane down to the external os. There has been for many years the contention that by leaving the healthy cervix we had a support for the vagina and bladder, something by which we could help to prevent or remedy an existing cystocele, and I still believe this to be a weighty argument in favor of leaving a healthy cervix, but if we carefully examine every cervix that is removed we find almost the same conditions prevail in many of them that exist with tonsils. A healthy cervix is a rare thing to find, especially in any patient where hysterectomy has become necessary. A generation ago Simpson and Emmett were calling atten-

tion to the danger of general infection from lacerated and ulcerated cervices. We have all noticed the frequency with which these cervices are filled with cysts containing purulent, mucopurulent or gelatinous material, a fertile field of infection which might well compete with any of the more recognized foci. We have only to recall to mind the rapid improvement in many a patient after a cervix amputation or repair. I believe that many obscure, nervous troubles may be traced to this focus, many chronic rheumatic and arthritic conditions, even arthritis deformans. I remember two cases of the latter, both young women who were subject to an offensive leucorrheal discharge which was at that time attributed to their condition and not suspected as a cause. These cases I believe now might have been prevented, but both drifted away from me and I know that they are both hopeless invalids.

I believe that we have not been careful enough in examining the cervices we have left behind. All fibrous, cystic, and macerated cervices should in my opinion be removed.

Multipara. Fifty years of age. Large myomata. Uterus removal above vagina. Less than two years after she returned with inoperable cancer of cervix and surrounding tissues. Another case—a widow, forty-one years old, had never borne children—multiple fibroids, apparently healthy cervix. Supravaginal amputation. Five years afterward came back with cancer of cervix.

I have become oversuspicious of any uterus that has once begun to show retrograde degenerative changes, fibroids, myomatous or other degenerations. How often we find a large neglected fibroid which had been doubtless for a long time a simple, benign growth but which upon its late removal, showed an area which had become malignant. We should suspect and completely remove every uterus of this character, even though at the time of operation there may be no suspicion of malignancy, for when these changes begin anything is likely to develop.

I remember the case of Mrs. D., mother of a family of grown up children. She had been an invalid for twenty years, the result of an immense fibroid. I was called hurriedly one morning some distance in the country, by the family physician, as he was unable to relieve her of a greatly distended bladder, which was caused by a mass protruding from the vagina, extending nearly to the knees. This proved to be a large submucous fibroid which so distended the vulva that it was with great difficulty that I finally found the urethral orifice with a catheter. She readily consented to go to the hospital as she greatly feared a repetition of the trouble in emptying her bladder. She had been told many times that her condition was hopeless and had no idea of submitting to an operation, but after a few days in the hospital and being assured that there was a good chance for her, she agreed. Besides the very large protruding mass, there was a still larger mass filling the whole left pelvis. Report came from the laboratory that there was a small area of the intrauterine portion of the protruding mass that was carcinomatous. I kept watch of her for several years and believe that there was never any recurrence.

Another case very similiar in a spinster sixty years of age, who kept her trouble to herself for years, until it was accidentally discovered by her sister. I found very much the same conditions I have described in the last case; a large, protruding, submucous fibroid with another subserous mass in the left pelvis, but in this case there was a roughened mass along the posterior surface of the pelvic tumor and a chain of hardened glands extending upward along the descending colon and its mesentery. Laboratory report: carcinoma. Death one and one-half years later—general abdominal carcinoma. Both these cases would never have been recognized as cancer cases if a comparatively early, complete hysterectomy had been done.

During the past few years many conservative surgeons and gynecologists have advocated and performed a great many myomectomies, even for multiple fibroids, extraserous, intermuscular or submucous. I would like to see the statistics of a large number of these cases followed up for the end results. Personally, I have not done very many myomectomies, preferring hysterectomy for the general reasons I have given, but in the few cases I have done my results have not been satisfactory.

Mrs. T., referred to me from a neighboring town. Thirty-seven years old, married eleven years, no children, never pregnant. Diagnosis, multiple fibroids. As both patient and her husband were very anxious for children, I did a multiple myomectomy, removing five variously sized and variously located fibroids. The immediate result was very satisfactory and patient returned home in splendid condition. Laboratory report from the tumor was simple fibroid tissue. Less than a year afterward her physician notified me that she had consulted him about a vaginal discharge and that he did not like the appearance of the cervix. Patient returned to me and I found quite an extensive ulcerative carcinoma, involving the cervix. Did complete hysterectomy, removing a wide cuff of vaginal wall, which seemed not involved, but there was a recurrence and I heard of patient's death about two years later. Had a complete hysterectomy been done at first, I have not the slightest doubt that this potential cancer would have doubtless been prevented.

Mrs. S., twenty-seven years old, a bride of less than a year. Myomectomy. Two external fibroids. Six years later consulted me about irregular hemorrhages. Examination disclosed more fibroids, both internal and external. Complete hysterectomy.

I do not wish to be understood as advocating the wanton removal of the uterus or any other organs when it is not necessary. I have never observed that removal of the uterus has had any effect upon a woman's subsequent health conditions, except the complete cessation of menstruation. Removal of the ovaries or all the adnexa, if the uterus is left, does not affect menstruation, which is purely a function of the uterus. The necessity for removing an ovary should be very great. There is a prevailing belief that the ovaries are of no further use to a woman after she has completely passed the menopause and the function of ovulation ceases. Why then do many of our patients fifty to fifty-five years old so frequently pass through a period of nervous debility, neurasthenia and hysteria during a prolonged convalescence? The ovary has been recognized as one of the endocrine

glands whose internal secretion is of the utmost importance to women under forty or forty-five. Why should this secretion cease when ovulation ceases? We know that women with infantile or undeveloped uteri, or even women in whom the uterus may be absent, may be perfectly formed women, but there seems to be no case on record where such a woman has been found without ovaries. Now if the ovarian secretion is the one thing that endows woman with that which makes her womanly why should she be deprived of it after she is forty years old any more than when she is thirty?

I have done a great many pelvic and abdominal operations and have never but once observed the complete absence of ovaries and that was in a woman who had for many years been an inmate of a lunatic asylum, hopelessly insane. No matter how old our patients we can always find the ovaries, shrunken, atrophied to be sure, but no more so than other organs affected by age.

339 Mill Street.

TRANSPLANTATION OF THE CERVIX

By W. Wayne Babcock, M.D., Philadelphia

About 1905 I was consulted by a woman of twenty-six years, who had been married six years and whose chief complaint was sterility. In this patient the cervix was long, conical, much invaginated, anteflexed, and the anterior wall was short so that the os uteri was

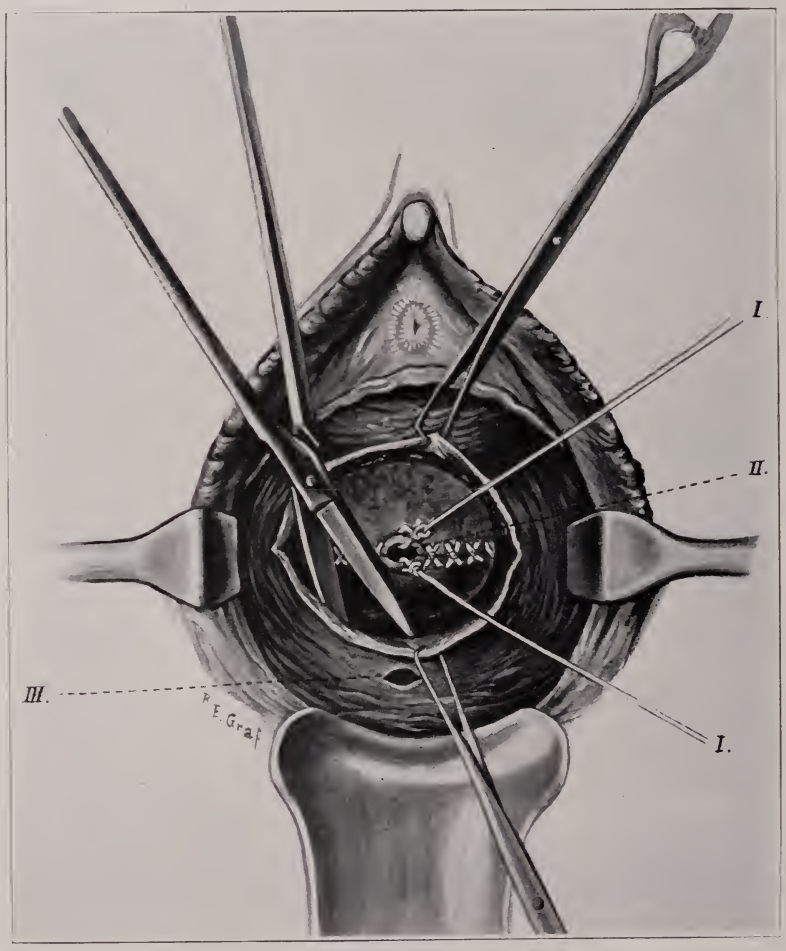

Fig. 1.—The cervix has been well freed from its overlying mucous membrane, a transverse laceration corrected, and guide sutures *I, I* introduced. The incision for the new os is shown at *III*. Often a much larger posterior incision is necessary and a much larger island of mucosa about the os *II* is left.

close to the introitus. It seemed possible that the elongation and position of the cervix might account for the sterility, and an operation

to transplant the cervix well back in the vaginal fornix was suggested. Under anesthesia a transverse elliptical incison was carried about the cervix, leaving a small island of mucous membrane around the os, and the vaginal wall freed from the rest of the cervix. A small transverse incision was then made well back in the vaginal fornix and the mucosa between the incisions freed by blunt dissection. By sutures fastened to the island of mucous membrane about the os passing through the first incision, under the mucous membrane and out of the incision in the fornix, the cervix was pulled back through the posterior incision and fixed by carefully uniting the mucous edges.

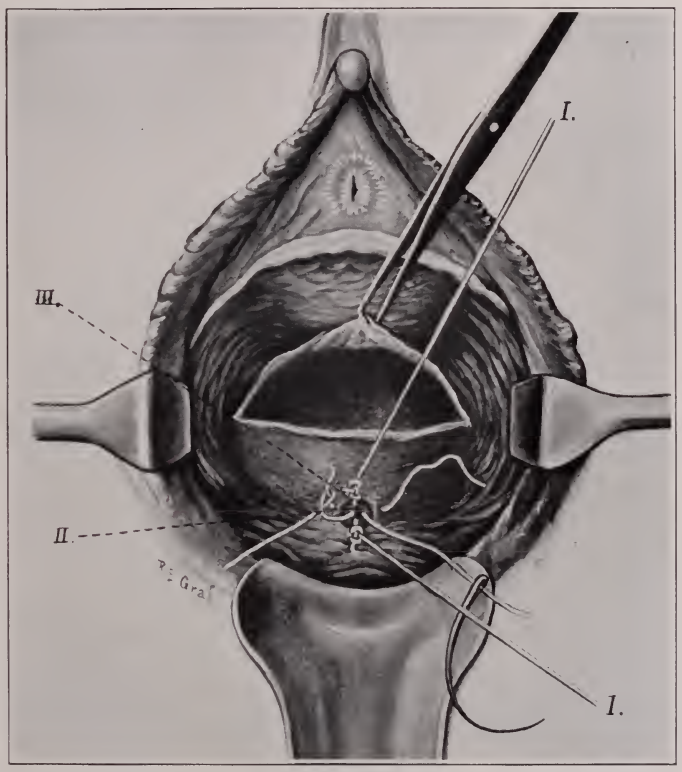

Fig. 2.—The cervix has been drawn by the guide sutures *I, I* to its new location, and the mucous edges are being approximated.

The anterior opening was closed by interrupted sutures, and the operation completed by introducing a supporting pack of iodoform gauze.

The postoperative course of this patient was not complicated, and not long afterward she returned to her home in England, became pregnant and was delivered of a healthy living child. Since this time she has borne a second child. The operation, which is a rather simple one, consists of a posterior submucous transplantation of the cervix, which may or may not be associated with a trachelorrhaphy, amputation of the cervix, or a shortening of the uterosacral ligaments.

The amount of mucous membrane left upon the cervix varies with the amount of invagination of the cervix that the operator wishes to produce, and also upon the condition of the cervix.

This operation may be indicated in:

1. Superinvagination of the cervix indicating operation where, owing to the small size of the uterus or other reason, amputation of the cervix is undesirable.

2. In certain cases of anteflexion of the cervix or anteposition of the cervix or uterus.

3. In certain cases of retroversion of the uterus favored or maintained by a short anterior vaginal wall, with anteposition of the cervix, and possibly also elongated uterosacral ligaments.

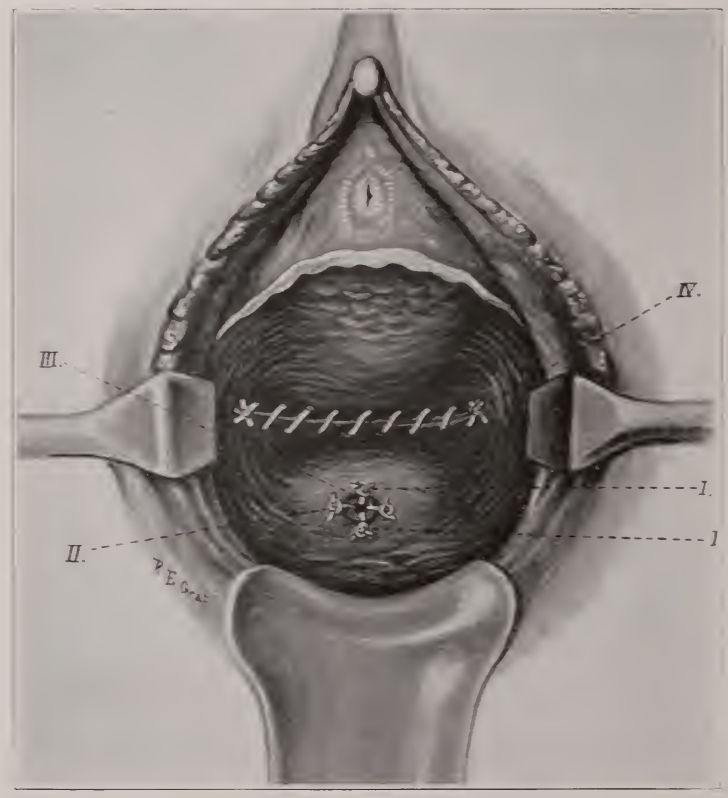

Fig. 3.—Both incisions closed, completing the operation. To further lengthen the anterior vaginal wall the anterior incision should be sutured in a vertical instead of a transverse direction.

4. In certain cases as a part of the operation for prolapsus or decensus uteri. The high posterior attachment to the uterosacral ligaments obtained serves to maintain the anteflexion and high position of the uterus in the pelvis.

5. As a part of the operation of amputation of the cervix to lengthen the anterior vaginal wall and to give added support to the cervix.

6. To facilitate the reconstruction of a mutilated cicatricial or adherent cervix, where a new cervical covering of healthy nonadherent mucosa is not readily available without the transplantation.

7. As a part of the operation of vaginal interposition.

The transverse incision over the culdesac may be used to gain entrance to the pelvis for associated intraabdominal work, and its length will obviously vary with the necessities of the particular case. The operation is conservative, easily carried out and seems to have a special, although perhaps limited, field.

Technic.—Usually it is easier to make the posterior incision first. With the patient in the lithotomy position and a weighted vaginal speculum in place, the cervix is grasped by a tenaculum forceps pulled well forward and the transverse incision through the mucosa of the fornix made. By blunt scissors dissection the submucous tissue is liberated forward to the cervix. The cervix is encircled by an incision well liberated, and after any necessary plastic work, by guide sutures introduced through the posterior incision, it is pulled back in place and the mucous edges approximated. Laterally the sutures may obtain added support by properly catching the uterosacral ligaments.

The anterior incision, if it is desired to further lengthen the anterior vaginal wall, is closed in an anteroposterior direction by sutures that should catch also the anterior uterine wall to prevent the formation of a dead space. It is obvious that the operative technic will be modified by the peculiarities of the particular case and by any necessary associated operations.

2033 Walnut Street.

DISCUSSION

DR. WILLIAM M. BROWN, Rochester, New York.—The doctor said the patient came back to this country after having been delivered in England. Did you have an opportunity to examine the cervix afterward, and if so, what was the condition after delivery? The thought occurs to me that the cervical canal was transplanted from the normal circular muscular fibers around it back through the muscle, where the muscular fibers would be almost transverse, and what effect did that have on delivery, and what was the condition of the cervix after delivery.

DR. STEPHEN E. TRACY, Philadelphia, Pa.—The procedure recommended by Dr. Babcock, is an excellent one in the type of case under discussion. Some years ago I operated upon a patient who had a badly traumatized cervix with much scar tissue. After the scar tissue had been dissected out, there was not sufficient tissue to cover the amputated cervix. In that case we separated the vaginal wall all around the uterus, split the posterior vaginal wall about 3 cm., and moved the cervix back. The denuded area was then easily covered and the operation gave an excellent result.

DR. BABCOCK (closing).—Examination of this patient showed a transverse laceration of moderate degree, such as we find in the average patient who has borne a child. If I had known she had this transverse laceration, I might have done otherwise. I thought she had a normal cervix except that the cervix was not well invaginated. Of course, the mucous membrane overlying the cervix is so thin and so elastic that apparently it was not deformed in any great degree.

GONOCOCCUS ARTHRITIS IN PREGNANCY

By Grandison D. Royston, M.D., St. Louis, Mo.

GONOCOCCUS arthritis, it is stated, occurs in from 2 to 5 per cent of all cases of gonococcus infection and is regarded by Osler[1] as the most damaging, disabling and serious of all gonococcus complications. That this complication is less prevalent in the female is well illustrated by a series of 252 cases reported by Northrup,[2] in which 230 cases occurred in the male.

Norris[3] mentions that in a series of 50 cases at Johns Hopkins Hospital, only seven were in the female. It is rather a surprising fact that in the Gynecological Service at the Washington University Dispensary, I can recall no case of gonococcus arthritis in dispensary patients, nor has there been any gynecologic patient admitted to Barnes Hospital since 1914 to the present time, in whom there was present a complicating gonococcus arthritis, or one in whom such a lesion made its appearance during the course of the patient's hospital stay. Considering that there are numerous cases of acute, subacute and chronic gonococcus infections seen annually in these services, gonococcus arthritis is rather conspicuous by its absence.

Norris, in his elaborate monograph on gonorrhea in women, discusses systemic gonorrheal infection at considerable length. He describes gonococcus arthritis as merely a local manifestation of a general infection, the gonococcus being transmitted by the blood stream from the primary focus.

Lindermann,[4] in 1892, was the first to demonstrate gonococci in pure culture from a case of gonococcus arthritis and thus positively established the clinical existence of this condition. Gonococcus arthritis usually becomes manifest during the chronic stages of the original infection, usually from two to eight weeks after the onset of the initial infection, and attacks more than one joint in over two-thirds of the cases.

Thayer and Blumer,[5] in 1896, were first to demonstrate the gonococcus in the blood in a case of endocarditis during life, and at autopsy were able to demonstrate the gonococcus in the vegetations on the mitral valve. That the origin of the infection in their case was the uterus and the vagina was demonstrated by the presence of gonococci in smears from the vagina and uterus taken at autopsy. Norris states that since this report numerous observers have recovered organisms from the blood and gonococcus septicemia has been established as a clinical entity.

Norris[3] tells us that Lofaro, in studying the blood of 67 cases of genital gonorrhea was able to demonstrate the gonococcus in the blood of 39. Lofaro believes that it is only where extremely virulent bacteria are present, or where the soil is especially suitable, that the gonococcus can enter or thrive in the blood. The same investigator points out that a loss of continuity in the surface at the site of the original infection is a predisposing factor to gonococcus septicemia. He also feels that in many instances the gonococci have disappeared from the blood stream when the joint lesions develop.

That gonococcus arthritis occurs only rarely in pregnancy may be assumed because there is no particular detailed reference to such a complication in our modern textbooks. To my knowledge, no great number or series of cases of this character has been reported. This is all the more astonishing when one considers how frequently gonococci are found in the vagina of pregnant clinic patients, and also when we consider that the changes which occur in the vagina and cervix during pregnancy should be the most suitable for the growth of the gonococci and the spread of the infection.

In considering gonorrhea in pregnancy there is little or no mention of widespread infection occurring during this time. In the literature regarding the dangers of gonorrheal infection chief emphasis is laid upon the renewed activity at the time of labor with the resulting puerperal infection and the occurrence of ophthalmia neonatorum; further mention is made of the danger of the infection reaching the decidua during the early months of gestation, resulting in gonococcus deciduitis, which frequently causes the termination of the pregnancy.

Williams[6] states that the occurrence of gonorrhea during pregnancy should never be regarded lightly. He emphasizes the danger of the infection during labor and the puerperium, and informs us that in rare instances widespread infection occurs, as the fatal cases of gonorrheal endocarditis observed in the Johns Hopkins Hospital and reported by Dabney and Harris[7] and J. T. Smith[8] illustrate. The case reported by Dabney and Harris is certainly a good example of a widespread gonorrheal infection during the puerperium. The patient was an unmarried girl, 19 years of age, who died about 24 hours after admission to the hospital, 26 days after a full-term delivery. The case was regarded as an ordinary puerperal infection, although intracellular diplococci were found in the uterine smear. The uterus was apparently well involuted and the adnexa were negative. The highest temperature was 103° F., and on auscultation over the apex of the heart, both sounds were replaced by murmurs. At autopsy the uterus was large, soft and somewhat congested, but there was no evidence of inflammation. Microscopically there was found considerable round-cell infiltration between the muscle bundles. Sections

stained for bacteria were negative. There were present extensive vegetations on the aortic valve and also to some extent, on the tricuspid valve. Cultures from the vegetations yielded the gonococcus, streptococcus pyogenes and the bacillus coli communis. The tricuspid valve yielded no gonococci.

According to Lea,[9] Halle, Jardine and others have reported cases in which the gonococcus was found in pure culture in the puerperal uterus, in the joints and on the valvular vegetations in ulcerative endocarditis. When it is recalled that numerous observers conservatively estimate that the gonococcus is found in 5 to 10 per cent of the vaginae of puerperal women in hospital practice, and also that in the cases of puerperal infection various observers give the gonococcus as the cause of the infection in from 5 to 33 per cent of such instances, it is rather surprising that widespread virulent infections do not occur much more frequently at this particular time.

De Lee[10] states that in gonorrhea during pregnancy, due to the succulence of the tissue, the gonococcus attacks the vagina and vulvar epithelium in addition to the urethra, vulvar glands and cervix. The vagina is thick and granular like a nutmeg grater and bleeds easily on touch; the cervix is swollen, eroded and easily vulnerable. De Lee further states that acute gonorrhea in gestation can cause rheumatism, with disorganization of the joints of the wrist, knee, hip, etc., and even endocarditis and general septicemia.

Norris points out that pregnant women are more susceptible to gonorrheal infection than their nongravid sisters, because of the increased blood supply to the genital organs and the softening of these structures incident to gestation. Norris states that gonorrhea is extremly frequent in pregnancy. He quotes several observers who give us information regarding the frequency of gonorrhea in the pregnant woman. Gurd[11] isolated gonococci from the vagina of 52 out of 113 pregnant women applying at a dispensary for treatment for pelvic pain. Leopold[12] contends that 20 per cent of pregnant women have gonorrhea. Stevenson[13] found 18.4 per cent infected, in a series of 1101 pregnant women. Sänger,[14] Burchardt[15] and Lomer[16] place the figure at between 15 and 30 per cent. Zwow[17] found the gonococcus in 75 out of 130 pregnant women. More recent observers, Taussig,[18] Harrar[19] and others, find gonococci present in 5 to 10 per cent of the cases. Recently I examined smears from 100 consecutive admissions in the prenatal dispensary and was able to demonstrate the gonococcus in only 3 cases. In view of the fact that from time to time serious widespread, systemic infections of gonorrheal origin occur during the puerperium, it is very important to be ever on the lookout for gonorrheal infections in the prenatal clinic. Many clinics, no doubt, take routine smears; judging from the high percentage of

positive findings by many observers, such a procedure would seem necessary; yet it must be remembered that these reports were undoubtedly based upon a very closely observed series and not selected from ordinary routine work. We feel, therefore that a negative smear in a hurried routine course in a busy prenatal clinic gives one a false sense of security, and therefore, we have not adopted vaginal smears as a routine measure. We feel that patients presenting a local irritation, as well as any pathologic discharge, should be examined bacteriologically. Such patients should be treated irrespective of the bacterial findings, because it has been our definite experience that in many pregnant women exhibiting a marked purulent discharge, repeated examinations demonstrate no gonococci until after delivery. We further believe that the treatment in these cases should consist of some sort of an antiseptic douche, and that local treatments, such as are given in the nonpregnant state, should not be considered in these circumstances. We feel that in this way we have been giving the subject more individual attention and more effective treatment.

Among 4284 admissions on the obstetrical service of the Washington University Hospital and the Barnes Hospital, we have encountered four cases of gonococcus arthritis during pregnancy. One case developed during the puerperium. I feel that on account of the fact that apparently very few cases occurring during pregnancy have been called definitely to our attention, and also on account of the extensive involvements in these cases, the marked amount of discomfort and disability occasioned by the lesions, that they warrant serious consideration. Further, in one case there is rather definite evidence that the disease was transmitted to the child in utero. This case is of unusual interest on account of this possible transmission.

The subject of transmissibility of substances through the placenta is perhaps no more elaborately discussed than in Williams'[6] textbook. He states that at present the consensus of opinion is that bacterial transmission occurs but rarely. He quotes from Lubarsch, 1896, that organisms of anthrax, pneumonia, typhoid fever and various infections due to pyogenic organisms may be occasionally transmitted but that such occurrences are very exceptional. Typhoid bacilli are transmitted to the fetus perhaps more frequently than any other organism. In this rather extensive review, no especial mention is made of gonococcus transmission, except the note that pyogenic organisms are occasionally transmissible.

The case observed in our series is very suggestive that this infection was transmitted through the placenta from the mother who, herself, had this widespread systemic infection, because five days after birth, with no evidence of any focus of infection, the child developed

a marked swelling in both wrists and the left knee, from which two weeks later gonococci were isolated. Full details of this case will be given below and in connection with this entity may be mentioned the series of cases collected by Kimball,[20] in which he reports eight cases of arthritis and pyemia in infants ranging from two to three months of age. In these cases there was absolutely no evidence of any local manifestation of disease. Seven of these infants were males and one female. It is rather singular that in another series of 70 cases of marked vulvo-vaginitis in the same hospital, there was only one case with secondary joint involvement. He is at a loss to explain the mode of entrance of the organism in these cases. Three cases showed a mild stomatitis, from one of which a diplococcus was isolated; Kimball suggests this as a possible source of infection. The histories obtained in these cases give little or no information concerning the condition of the mother, either before or after labor. Kimball does not mention the possibility that these conditions may have been transmitted as a result of systemic infection of the mother.

CASE REPORTS

Case No. 1.—M. B. Ob. No. 656. White. Age eighteen. Single. Gravid. 1. Admitted to the Washington University Hospital June 27, 1912. Pregnancy normal until the preceding day, when inflammation of the wrist, shoulder, knee and ankle joints, with slight swelling of the feet, were noticed by the patient. Expected date of term July 4, 1912. On admission, local examination showed a small cyst on the right labium majus and a peculiar eruption over the entire body suggestive of lues. Past history, uneventful, except that patient had noticed a profuse, creamy vaginal discharge beginning four months after the onset of pregnancy. Patient was delivered June 29, 1912, after labor of four hours' duration. July 5, knee was aspirated and the cloudy fluid thus obtained was cultured and a pure culture of gonococcus was isolated. Wassermann, July 3, 1912, was negative. July 18, left elbow became involved. Sept. 13, left knee was ankylosed; slight flexion of left leg; left foot was swollen. Patient was discharged Nov. 18, 1912. The joints, especially the hands and knee, showed some fibrosis. Pelvic examination on discharge showed a firm outlet well contracted; cervix soft, admitting one finger, with triangular tear; uterus of normal size, in second degree movable retroversion. Slight induration on each side; no tenderness, no masses. After patient had been at home for 10 days, her hip and knee became painful. Six months later, she re-entered the hospital on the Orthopedic service where treatment was continued; later arthroplastic operations were performed on the wrist and knee joints. July 3, 1912, five days after birth, the infant's wrist and left knee began to swell. No local lesions were apparently observed in the child. On July 21, the infant's joints showed fluid for the first time. Aspiration revealed a fluid from which the gonococcus was isolated. On August 10, the right knee became involved and on Sept. 13, the left elbow. Later the child developed an ankylosis of the jaw and was under the care of the Pediatrics service intermittently for about 2 years.

Case No. 2.—C. P. Ob. No. 2162. White. Age eighteen. Gravid. I. Patient was admitted to the medical service June 1, 1918. Two weeks previously she had had pain and swelling in her right elbow,—later, in wrist and shoulder; on third

day in joints of left arm; fourth day in right knee and ankle. As soon as one joint became painful, pain in the previously involved joint would subside. Last menses about Dec. 1, 1917; term approximately Sept. 8, 1918. Wassermann, gonococcus and Tbc. fixation tests negative. Local examination July 20, 1918,—revealed the inner surface of the labium minus reddened, moist; mucopurulent vaginal discharge; urethral orifice reddened; urethra tender and on milking latter, a small amount of secretion was expressed; cervix long, soft, closed. Cervical smears showed many epithelial cells, some polynuclear leukocytes and many bacteria, among which were diplococci. The urethral smear showed many polynuclear leukocytes, some epithelial cells, many bacteria, and among them diplococci, possibly some of which were intracellular. July 29, 1918, patient delivered of a child weighing 2135 grams. Nov. 15, 1918, bimanual examination showed a mass in the right adnexal region which had previously been the size of a large peach, now the size of a small lemon, not tender. Uterus well involuted. No visible macroscopic evidence of gonococcus infection present. Smears from vagina, urethra and cervix, however, were definitely positive for gonococci. From the time of delivery until shortly before her discharge from the hospital, treatment for the involved joints was primarily dry heat and gonococcus vaccine.

Case No. 3.—I. S. Ob. No. 2921. White. Married. Age twenty-three. Gravid. I. Patient admitted to hospital May 7, 1920, because of acute arthritis of right ankle, third right metacarpophalangeal joint, present since April 20, 1920, (17 days). Family history and past history both negative. Two weeks before onset of symptoms, patient contracted gonorrhea from husband, who was under treatment for an acute infection at the time. Macroscopic and microscopic examinations of genitalia were negative. There was one carious left upper wisdom tooth present. Nose and throat examinations, Wassermann and tuberculous complement-fixation tests were negative. Gonorrheal complement-fixation test positive, 1-plus. On May 13, 1920, 5 c.c. of purulent and bloody fluid was aspirated from the right ankle joint. Smears from this fluid showed fresh leukocytes, many of which contained gonococci. May 17, 1920, a fluctuating area appeared over the right lateral malleolus which was incised. May 18, 1920, the third right metacarpophalangeal joint became red, swollen and painful; pain appeared in the right shoulder. Patient was given Neisser bacterin and the ankle was put in a cast. May 28, 1920, the membranes ruptured spontaneously, followed by a low forceps delivery 20 hours later. The child was breast-fed, gained nicely; had a nonspecific conjunctivitis from the third to the sixth day after birth. The patient was treated with the right hand in a splint, ice cap to the joint; most of the time the right ankle was in a cast, with short intervals of removal, the right foot being treated with applications of dry heat. Under this regime, the infected joints became less painful and the inflammation less marked. Pelvic examination six weeks postpartum revealed a well involuted uterus; no evidence of adnexal disease; no pathologic discharge; slight cervical tear with small adhesion between cervix and vaginal wall. March, 1922, patient reported for examination which revealed a normal pregnancy, without any evidence of gonococcus infection. Pregnancy to date (Sept. 18, 1922), uneventful, with date of expected delivery approximately Nov. 15, 1922.

Case No. 4.—V. W. Ob. No. 4040. Colored. Age twenty-five. Gravid. IV. Last labor 2 years previously. Child died on fifth day, cause unknown. Patient applied at the obstetrical dispensary on Jan. 25, 1922, for prenatal care. Examination revealed an apparently normal pregnancy of 16 to 18 weeks. There was an erosion 2 cm. square on the posterior lip of the cervix and about the external os, and there was a history of bleeding after coitus. Although the patient said

that she had had a vaginal discharge since the age of 15, there was no appreciable discharge present at this time and no smears were made for microscopic examination. Last menses appeared about the middle of Sept., 1921; date of term, latter half of June, 1922. Patient exhibited no abnormal symptoms during her monthly dispensary visits until April, 1922, when she complained of headaches and pain in her left shoulder which disappeared within a few days. On April 29, 1922, patient was visited in her home because of pain in her arms and legs elicited both on active and passive motion. Both wrists, right elbow, right metacarpophalangeal and right knee joints involved; also slight swelling of the dorsal surfaces of both wrists. Examination at this time revealed several carious teeth, acute pharyngitis and an erosion of the cervix uteri, with considerable mucopurulent discharge containing numerous gonococci. Two days later, the patient was brought into the hospital, suffering great pain in the involved joints. Past history, aside from the usual exanthemata of childhood which were free from complications, influenza four years before, and a vaginal discharge since the age of 15, patient had always been healthy. May 4, 1922, four c.c. of thick, turbid, light yellow fluid was aspirated from the right knee. Smears and cultures revealed no organisms. Wassermann negative. Gonococcus fixation-test positive, 2-plus.

June 4, 1922, child weighing 3390 grams delivered spontaneously; fed artificially without difficulty. Mother was treated with various gonococcus vaccines without any marked improvement. Joints were in splints during the acute stage. Dry heat, later, active motion applied to the joints after the acute symptoms had subsided. Pelvic examination at discharge showed the cervix closed, broad, soft; corpus well involuted, anteflexed, normal size, movable, not tender. Palpation in both adnexal regions elicited tenderness, no masses detected. Resistance of patient made examination somewhat unsatisfactory. Nothing found in pelvis at this time indicated an acute process.

July 26, 1922, patient was discharged from the orthopedic service because of leaving the city. At this time she was able to walk without support, though she stated that her right knee was still troublesome. Her right wrist had no perceptible motion; left wrist had fair motion which was increasing daily.

In going over these case records one is impressed, first of all, by the fact that the arthritis in all four cases came on in the latter half of pregnancy, and in three instances the first symptoms occurred after 35 weeks' gestation; and in two instances the patients were not observed previous to the onset of the arthritis, but in one instance the patient had been to the dispensary, being registered for a period of three months before the onset of the arthritic symptoms. No smears were made from this latter case previous to the development of the arthritis, apparently the condition having been overlooked. The third patient contracted her infection definitely between 32 and 35 weeks' gestation and had been perfectly normal up to that time. In only one instance was there any certain evidence of pelvic inflammatory disease present on discharge from the hospital. In every case, the puerperium was not in any way uneventful, aside from the arthritic involvement.

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DISCUSSION

DR. WM. M. BROWN, Rochester, N. Y.—Dr. Royston I believe made the statement that the ordinary therapeutic measures that would be instituted otherwise should not be undertaken during pregnancy. I have not had much fear of that. In fact, it has been a common experience that where we have had badly infected girls come in with a profuse vaginal discharge any time during the last few weeks or few months of pregnancy, if we put these patients in the hospital, and packed the vagina thoroughly with 10 per cent formalin gauze, ten minute application every day or two, it certainly cleaned them up, and it is, to my mind, a valuable preparation for a delivery which may be imminent.

DR. JAMES E. DAVIS, Detroit, Michigan.—I would like to emphasize one point both from the standpoint of the laboratorian and clinician. The essayist has indicated that a vaginal smear is often useless. From a laboratory standpoint it is quite useless excepting where, of course, you have a positive finding, but a negative finding means absolutely nothing. Smears should be taken routinely first from Skene's glands, after the finger has been inserted so as to practically obliterate the depth of these glands from one side and then from the other, and next from the cervix. Sometimes it is necessary to exert pressure upon the cervix in order to get good smears, and thirdly, from the meati of the Bartholin ducts. Here, a certain degree of massage of the duct should be made to be sure of getting a fertile smear.

THE PERNICIOUS EFFECTS OF THE USE OF STEMS IN THE UTERUS AND THE DANGER OF INTRODUCING SOUNDS AND OTHER FOREIGN BODIES WITHOUT PREPARATION

By James N. West, M.D., New York, N. Y.

I VERY much desire to do something toward the prevention of the disease and suffering which come oftentimes as a result of the introduction of stems and other foreign bodies into the uterus and leaving them there for a considerable length of time. The use of stems in the uterus is a procedure fraught with so much danger that I cannot conceive why any surgeon with moderate instruction would resort to it.

About thirty-five years ago, the use of intrauterine stems was at its zenith, but about the time I was an interne in the Women's Hospital, in 1894, it was on the decline. It was considered in those days quite the thing to invent some variety of the uterine stem for anteflexion, dysmenorrhea and sterility. But their use was on the decline for the reason that it was found to be an unsafe procedure which often resulted in parametritis, pelvic abscess, peritonitis, endometritis, and sometimes death, all of which the patient risked by this treatment for the relief of a minor condition. Furthermore, it was based upon a false conception of the cause of dysmenorrhea in anteflexion.

I am presenting for your inspection a collection of twelve different kinds of intrauterine stems, and although you would hardly think it, the inventor of each of these stems considered that he had added something to the sum total of gynecology that would increase his reputation and aid in the relief of suffering women. This form of treatment was dying a natural death on account of its inherent viciousness, but recently there has been a revival in the form of a pessary having a central stem fixed into a little saucer-like base, and with its intrauterine end spread out somewhat in the shape of a stretched out hair pin. The two intrauterine limbs of the stem are supposed to extend across the fundus and in that position to retain the stem in the uterus by their resilience. This stem is used for the prevention of conception and has no name. I have seen a good deal of disturbance as a result of its use and have removed several stems in my office. I am presenting herewith one case which illustrates what the use of this stem may do.

Mrs. J. I. J., age twenty-five, married six years, three children, oldest five years, youngest ten months. Normal deliveries. Admitted to Post Graduate Hospital, March 18, 1919.

Two months before admission the patient consulted a doctor for prevention of conception. He introduced an intrauterine stem to be left permanently. In the early part of March she began to complain of severe pain in the pelvis with chilly sensations alternating with high fever. The diagnosis read, pelvic cellulitis with pus formation in front of the uterus and left broad ligament. The patient was treated with an ice bag to the abdomen and with hot douches.

She was operated upon March 24. A vertical incision was made through the left rectus muscle nearly to the horizontal ramus of the pubes. A cavity was encountered containing a large quantity of pus. An incision was made through to the vagina between the bladder and uterus through which a rubber tube was brought from the abdominal incision into the vagina.

The patient was discharged improved June 28th. There was still an abdominal fistula which discharged from time to time a small amount of pus. Readmitted Aug. 8, 1920, with a double pyosalpinx and abscess of left ovary with sinus of abdominal wall. Operation August 9. Dissection of sinus. Removal of left tube and ovary, right tube and appendix. Drainage with iodoform gauze through the culdesac. Discharged Sept. 11, 1920. Improved. There still remained a small abdominal fistula.

This history of danger of death, of suffering, and permanent sterility, dates from the introduction of an intrauterine stem for the prevention of pregnancy.

The use of intrauterine stems for anteflexion still exists to quite an appreciable extent, but having heard the discussion of the subject years ago, and having seen that the majority of gynecologists have given up their use, it occurred to me that there must be some reason why men continue such an archaic, dangerous and pernicious form of treatment. I finally have assumed that it is the result of ignorance, but there must be some authority in works of gynecology for the practice. To clear my mind on this subject, I have looked up the subject in several text books to see what position was taken by the authorities in regard to the use of stems. In some I find a most cursory mention of their use for the relief of dysmenorrhea of anteflexion, and in some the subject is not mentioned.

I herewith present some epitomized references.

Montgomery, Gynecology, 1912. "Twenty-five years ago the employment of the stem pessary was the favorite method of overcoming an anteflexion, etc. The objection to its use is that it is a source of irritation, affords constant danger of infection to the uterine mucosa and may lead to serious trouble."

Hirst, A Textbook of Diseases of Women, 1905. "An intrauterine stem pessary which would seem to be the most suitable implement for the correction of anteflexion cannot be recommended, for the prolonged retention of any foreign body in the uterine cavity predisposes to infection of the endometrium and to secondary infection of the tubes and ovaries."

Graves, Gynecology, 1918. "As has been stated the use of intrauterine pessaries is unsurgical in principle and may be followed by inflammatory processes in the tubes, of which we have observed two instances, nevertheless, even with this risk the procedure is regarded as justifiable and is very widely employed. If applied to the proper cases the results gained by pessaries both for dysmenorrhea and sterility are comparatively good. The pessary is left in from six weeks to two

or three months. It must be very carefully watched by the attending physician, and should be removed at once if undue leucorrheal discharge or pelvic pain appears.''

Crossen, Operative Gynecology, 1915, advocates its use.

There is no occasion for further quotations. A general practitioner seeking for a means of relieving sterility and dysmenorrhea due to anteflexion, turns to his work on gynecology, his answer will be in accordance with the book which he happens to have upon his shelf. If he turns to Crossen he gets advice to use the intrauterine stem. If he turns to Montgomery, he finds the subject mentioned and is advised not to use a stem. If he turns to Graves, he is told to use a stem but that his patient will be in grave danger from its use. If all of these works are read, he will be bewildered, but if he is a man of ordinary judgment he will not use a stem. The same thing which applies to the use of the stem for anteflexion and sterility, applies with still more force to the stem now being used to prevent conception. The prevention of conception in certain cases is a humane and proper thing, although not always legitimate, but the use of the intrauterine stem is an extremely dangerous and improper method. I wish to thoroughly discourage the use of intrauterine stems for any purpose whatever and I trust that an expression of opinion on the part of members of this Society may be given on the subject in order that the opinion of the writer may be reenforced by the greater authority of opinions of members of this Society.

The same thing which applies to the use of intrauterine stems applies to other foreign bodies in the uterus.

In doing dilatation and curettage one should always wipe out the cervix with tincture of iodine so as not to carry the organisms which are found in the cervical canal into the body of the uterus and vaccinate them there with the curette. This applies to any other intrauterine instrumentation, except the use of forceps in delivery.

I would advise against leaving uterine packing more than thirty-six hours and then the use of iodoform gauze from which the iodoform has been washed by wringing out in water three or four times.

Finally, the ideal surgical relief for dysmenorrhea, which is practically uniformly successful, is a thorough dilatation of the cervix and Emmet's amputation to a point one-third of an inch below the internal os. This procedure has resulted uniformly in the relief of dysmenorrhea of anteflexion and in many cases has relieved sterility.

71 West Forty-ninth Street.

DISCUSSION

DR. HERMAN E. HAYD, Buffalo, New York.—Most physicians do not realize the danger of introducing a sound into the uterus. That is one of the reasons why Joseph Price spoke so strongly against all kinds of intrauterine tinkering in the shape of curettage and the introduction of sounds. Price taught, the curette and sound were seldom or never necessary, and therefore, always capable of doing much

harm. However, I believe that is going too far, just as I think Dr. West goes too far in condemning the stem. I am satisfied the sound, when used carefully and judiciously, can be a useful instrument, and I am satisfied that curettage is often a very necessary operation.

So far as the stem pessary is concerned, there are many things that we may do but cannot teach too freely. I believe occasionally there are cases, if carefully studied, where the stem pessary is of great value. I have used the stem pessary quite frequently. I have seen a number of cases after a curettage and dilatation, say in three to six months, where the cervix recontracted and the dysmenorrhea returned, and then I dilated again and put in a stem pessary. The canal remained open, the dysmenorrhea was relieved, and I can report one case where after a number of years of sterility, she became pregnant and had a full term baby. Therefore, I would not like to take the position that the stem pessary is absolutely useless. I do believe occasionally it is of great value and should only be employed by men who will realize the dangers in its application and will remove it at once if it causes undue irritation.

DR. GRANDISON D. ROYSTON, St. Louis, Missouri.—I should like to ask Dr. West to define a pathologic anteflexion that would require amputation of the cervix. Another question: Would he amputate the cervix for dysmenorrhea in a young, unmarried girl. We all see young unmarried girls in whom bimanual examination fails to reveal anything in the way of uterine displacement, anteflexion, or retrodisplacement, yet they have dysmenorrhea. Many of these cases are really occupational disorders. We find cervical stenosis if we are to believe the statement of Sellheim that the normal diameter of the cervix is four millimeters, and when the canal measures less than that some obstruction may be expected. In such cases a simple dilatation and curettage have not been uniformly successful in my hands. I have been using the intrauterine pessary in unmarried women, where there is no infection. The patient is warned not to take any douches, and we assume she will not be exposed to any sexual infection. The use of the Carstens' intrauterine pessary has been successful in relieving the majority of these patients of dysmenorrhea. In ten years I have not seen any infection follow its use. Only this month I delivered a case who had one of the spiral gold pessaries inserted in Chicago for producing sterility. She was three months pregnant when seen and the pessary was still *in situ*. She had paid forty dollars to prevent that pregnancy. Some years ago where I was working in a dispensary, an intrauterine pessary was inserted in a patient for the cure of sterility. This patient developed a streptococcus cellulitis and almost lost her life. Any pelvic infection contraindicates the use of the pessary. I think where such a pessary is used, the woman should be warned against intercourse; she should take no douches during this period, and she should always be under observation.

DR. JOHN OSBORN POLAK, Brooklyn, New York.—During last year we have had six cases of general peritonitis brought into our services resulting from the use of the intrauterine stem. I will admit that when these cases were carefully investigated they show that the stem should not have been used. An important point is the absence of infection, but with the cervical glands built on such a histologic plan as they are, having the power to retain infection for a very long time, particularly if that infection is a streptococcic infection, and we know that a very large number of these infections are streptococcic, the stem pessary seems to light up the condition. A large number of cases of parametritis, result definitely from intrauterine treatment by sounds or stems, and at operation one finds about the ovaries and tubes, not endosalpingitis but perisalpingitic and periovaritic disturbances the result of intrauterine cervical treatment and the use of the cervical

stem. There is no question that there is a certain class of malformed uteri in which the stem, in the absence of infection, will relieve the dysmenorrhea and develop the size of the uterus. That is admitted, but I am frank to say that we cannot tell exactly the class every time.

DR. EDWARD J. ILL, NEWARK, NEW JERSEY.—I think my friend Dr. West is rather severe on us chaps who are old and are using the stem pessary. I want to take exception to some of the statements that have been made. Extreme views are apt to be erroneous. Anybody who uses stem pessaries, as I have shown to the members of this Association, must have difficulty. These pessaries invite infection. The pessary that has been exhibited is not the sort of pessary one should use. Take a patient who has not had infection, often a simple dilatation may suffice. Our patients are very carefully prepared. They are just as well prepared for that as they are for a major operation. That is a *sine qua non.* The uterus is very carefully dilated to a No. 36 French, and curetted when necessary under constant irrigation. No weight ever touches the part. The glass stem is No. 34. This glass stem never reaches the fundus of the uterus; it is within a centimeter of the fundus of the uterus. It is held in place by iodoform gauze which is left for three days, then renewed, and in six days it is all removed. I can see harm from any intrauterine pessary which is left in for weeks and months. There is no question about that. Where the patient is kept in bed under careful observation anything serious rarely happens.

The last serious case I heard about was a young woman who was sterile. She had dysmenorrhea. I put in a pessary and she left the hospital in good shape. She returned in three weeks with the pessary; she developed an abscess for which she was operated on. When we examined the pus we took out it contained a multitude of cocci. If I had not examined her I would have failed in the operation. That sort of thing must be considered. If you leave a stem pessary in for weeks and months, and say that patient must not have intercourse, you invite other things.

DR. HUGO O. PANTZER, INDIANAPOLIS, INDIANA.—We are all familiar with the baneful effects of intrauterine stems, and their inordinate use has been well put forward in the paper. I would endorse all that has been said since in the discussion. I have used intrauterine stem pessaries in cases of this sort. Given a woman who has a uterus like this, (indicating on blackboard), with immature development at puberty, you have here an attenuated uterine musculature, and ofttimes the uterus is held in a malposition and exhibits undeveloped musculature. Under proper antiseptic precautions, in a case that is not already infected, you can put in the intrauterine stem for a short time.

DR. WM. S. BAINBRIDGE, NEW YORK CITY.—I would like to ask Dr. West if he does not think that in our attempt to rid ourselves of the stem pessary, we may not, in some cases, run a greater danger along another line? I have seen a number of cases, young women who have had amputation of the cervix, in which the sterility was not overcome, and others where pregnancy did take place, but with severe dystocia resulting from the amputation.

DR. JAMES K. QUIGLEY, ROCHESTER, NEW YORK.—About six months ago the most popular exponent of contraception was in Rochester and a special meeting was held for the enlightenment of physicians, and about twelve of us attended. This woman showed all contracept devices, and among them was a gold wire Y-shaped stem pessary. One physician in New York she said had approximately 200 cases under observation where he had introduced the stem pessary. A short time after that I had a patient, the mother of two children, who had been to New York and evidently became inoculated with some of these pernicious contraceptive ideas and had one of the pessaries introduced into the cervix. She came to me com-

plaining of pain and hemorrhage. I put her on the table, examined her, and said, "You have had a stem pessary introduced." She replied, "Yes." I said to her, "You paid for it," and she replied, "Yes," and I said, "Unless you have had it removed you have been 'sold' because you have no stem pessary." She said, "I am sure I have it because I have considerable pain." I explored the cervix; the button at the bottom had bent upon itself. The stem is very pliable, and the button was within the cervix well up toward the internal os. She had no infection following its removal and not much pain.

I should like to protest against the amputation of the cervix in a childbearing woman, not alone on the ground of sterility but on account of dystocia afterward.

DR. BENJAMIN RUSH McCLELLAN, Xenia, Ohio.—Where there is a sharp uterine flexion with a short anterior vaginal wall I certainly would not think of using a stem pessary. The unhappy result in one such case is a lesson never to be forgotten. The best way to deal with such a case is first of all to lengthen the anterior vaginal wall by dissecting it loose from the cervix and reattaching it at a much higher level. This gives the cervix uteri a chance to drop into the posterior fornix and tends to straighten the uterine canal. The operation is comparatively simple and entails a minimum of risk. Even where this condition is associated with hypoplasia, which is so often the case, this simple operation should precede further treatment of the latter condition.

DR. ARTHUR T. JONES, Providence, Rhode Island.—I want to mention the case of a young woman who came to me with one of these "gold brick" wish bone stem pessaries in. She said she had been wearing this pessary for about two years, evidently with the idea of preventing conception. She was told that they had some gold pessaries, and for $75.00 a New York doctor would put in one of the "solid gold ones." She had been wearing that gold one for more than a year; she was having constant bleeding. She was sent to me, I examined her, and found an intrauterine solid gold pessary in there, but through the central opening of the flange which fits about the cervix was a mass of spongy tissue. I removed the pessary, and sent her to the hospital and curetted her. She insisted upon leaving the hospital on either the fourth or fifth day, and by the time I got my pathologic report back she had gotten from under my care and had gone to Europe. The report of the specimen was that it was "probably malignant." I felt myself that the case was malignant and in this case a malignant condition was probably set up by the prolonged use of this pessary.

The glass pessaries I have used to develop a small uterus and to give the woman a chance to become pregnant.

DR. ADAM P. LEIGHTON, Portland, Maine.—Since some remarks have been made about the introduction of stem pessaries for bringing about abortion, I cannot help taking this opportunity to mention the technic a certain Portland lady made use of in bringing about an abortion and the retention of this foreign body for a considerable length of time. I was called to see a woman who had a foul vaginal discharge and found she had never borne any children. I put my finger up in the fornix of the vagina and found seeming scar tissue in the left part of the cervix and in the vault of the vagina. I thought it was an old tear. I swept my finger up into the fornix and pulled forth an eight inch piece of insulated copper wire which had been inserted and left in the uterus and vagina for fourteen months. She had produced an abortion fourteen months before. This copper wire was deeply embedded in the cervix and wall of the vagina. Following its removal she made an uneventful recovery.

DR. ROLAND E. SKEEL, Los Angeles, Calif.—Dr. Ill and Dr. West are discussing two different matters. Dr. Ill is discussing the retention of the stem pes-

sary for a short time, under close observation, and after thorough preparation as for any surgical procedure; and he retains the stem in the uterus with iodoform gauze, which is quite different from inserting a stem and leaving it in the uterus for several months. For some time my immediate colleague was a firm advocate of the stem pessary, but in one year I had to remove the pelvic organs of at least two of the patients in whom the stem had been retained for a considerable period of time. It seems to me if the men who use the stem pessary could always get their patients back when damage resulted, they would exercise more care in its use or discontinue it altogether. A woman who leaves the hospital with a stem pessary, wears it three or four months, and then develops an inflammatory condition of the uterus frequently fails to return to the physician who inserted it, so that he is not aware of his bad results and persists in the same plan of treatment. It is this class of patients Dr. West is discussing and not the carefully guarded patient whom Dr. Ill mentions.

Next as to anteflexion, we may grant there are a great number of cases of anteflexion; in fact, I believe that most nulliparous women have anteflexion, but in my own mind I am unable to associate this anteflexion in a causative relation with dysmenorrhea.

Having overcome the anteflexion one cannot promise that the dysmenorrhea will not return and be as bad as before. It may relieve for from three months to a year, but unless pregnancy supervenes no permanent good will have been done. We do not curette patients with scanty, rather than profuse menstruation and the operation thus consists of nothing more nor less than a simple dilatation, which in turn is nothing more nor less than nerve stretching. The same relief from pain occurs when we stretch the sciatic nerve for protracted sciatica. Certainly we cannot predicate any obstruction, for we have all seen these patients when menstruating and observed the blood oozing from the cervix in a steady stream, quite different from the spurt which would occur if there were an obstruction which was overcome by the painful contractions of the uterus. Conversely, while we understand that the internal os is in some manner a barrier to ascending infection, it is hard to imagine a cervix from which the blood trickles out offering any barrier to the ascent of a motile spermatozoid. Perhaps we can develop the uterus by the stem pessary used as Dr. Ill suggests and if this will cure the ordinary type of dysmenorrhea we should proclaim it from the house tops, as I do not know of any patients who come to the office of the gynecologist more often and leave with as little satisfaction, as young girls with dysmenorrhea.

DR. WEST (closing).—I have seen two young women die of septicemia, probably the result of the use of the stem pessary and have been called in consultation in several cases where the women have barely escaped death. The condition for which the stem is used is a minor one for which the patient is subjected to the danger of the use of a stem.

This whole subject brings to mind evolution. In the evolution of animal life we had one period known as the molluscan, where the mollusks were the chief group of animals on earth. That lasted for a certain time and was succeeded by the reptilian period which predominated. Finally it came to our time when mammals predominate. Our evolution in surgery should have brought us to the abolition of stem pessaries and those who continue to use them represent our reptilian or second period.

This pessary is from Gaillard Thomas. He made one of these pessaries. It is a ridiculous looking thing, and nobody would think of using it now. There are other stem pessaries in this collection which no one would advocate the use of, but they have most distinguished names. Dr. Peasley was one of the fathers of gynecology, and many of us use his instruments today, but we should not use the stem because Dr. Thomas and Dr. Peasley advocated stem pessaries in those days,

This is a case where evolution is taking place, and I am trying to help evolution along a little by condemning the use of stems in the uterus for any considerable time on account of the damage they are liable to produce.

Doctors used to curette patients in the office without any preparation. Some good men did that. They do not do it now. All women did not die from this procedure. If they did, practitioners would never have done it a second time. A good many women survive the use of different kinds of stems. A large number survive with damaged parametria, like the beautiful young married woman whose case I have reported. Some of them die of septicemia, and why should we continue to use such stems? One of the chief advocates in modern gynecology admits that these stem pessaries are dangerous and should be carefully watched. Then what should be done where formerly a stem would have been used? This brings us to the subject of amputation of the cervix. I want to say a few words about that because I mentioned it in my paper as one of the methods of relief for dysmenorrhea and sterility.

I would like to answer all the questions in a short time and think what I am going to say will cover the ground without making individual answers.

Quite a large number of young women have anteflexion. When the anteflexion is considerable it becomes pathologic, and often these patients develop dysmenorrhea. These extreme forms of anteflexion are undoubtedly deformities; they are developmental troubles. The uterus as it develops in the young girl, when she is just coming to puberty, develops against a short posterior vaginal wall.

Here is a uterus, with a very complete flexure. You will always find a short posterior vaginal wall, and the anteflexion may be severe. If the uterus develops normally or develops nearly in a straight line, there is a good big space back of the cervix. What happens is this: the girl in her development does not develop the vagina properly, and as the uterus grows the cervix meets with obstruction and turns toward the point of least resistance which is the canal of the vagina; it turns upon itself and creates an acute flexion. I have amputated the cervix at the point where the acute anteflexion is, and the tissue at the point of flexure is almost like scar tissue; it feels almost like cartilage; the musculature is almost gone or so atrophied that you can scarcely find it. We know that the cervix is well supplied with filaments of sympathetic nerves. These filaments when anteflexion has occurred are pressed upon in this part of the cervix just like they would be in scar tissue of the cervix after a laceration. The result is tissue which will not dilate when the uterus dilates with the congestion of the menses, just the same as any organ which has a tight capsule is subject to pressure when inflamed. These sympathetic nerve filaments are involved in the tissue which cannot dilate with dilatation of the rest of the uterus and while the pressure exists the patient suffers pain and cramps. Anteflexion is quite common but most of these young girls that come in for its treatment will be relieved if they become pregnant, and if a girl suffers very much we give her an analgesic to relieve pain for a few hours during the worst of the dysmenorrhea.

Then comes the more severe type of dysmenorrhea where the anteflexion is acute, and the patients suffer extremely. Sometimes such a patient will be hysterical. I have seen cases where they would actually become insane for a short time. Cases of this kind have led me to study the causes of pain in dysmenorrhea of anteflexion. Such is the following case of acute anteflexion. Dilatation will relieve about 40 per cent of these cases, but 60 per cent of them in two or three months will be as bad as ever. Forty per cent will be relieved sufficiently not to require further procedure. This little French girl whose mother was a widow, and for whom the necessity of earning her own living was absolute, suffered extremely from dysmenorrhea. She lost one position after another as a result of the disability. I

had dilated the cervix well, and she was much better for two months, then the trouble returned with all its force. I was requested to remove the ovaries and tubes. They thought she would have to go to an insane asylum, and I was urged to do anything I could for her relief. I amputated the cervix quite high, and the result was remarkable. She has not had any more dysmenorrhea; she has been cured absolutely. A short time afterward she got married and had one abortion after another. Finally she became pregnant, and on account of pernicious vomiting of pregnancy, I put her in the hospital. She finally carried a fetus to seven months because she was kept in bed and treated carefully for pernicious vomiting of pregnancy. The baby died. I got rid of the dysmenorrhea without removing the ovaries, as she and her mother wanted me to do.

This was my pioneer case of amputation of the cervix for dysmenorrhea and I had amputated so high as to interfere with the function of reproduction. In later cases I leave about one-third of an inch of the cervix below the internal os, which gives excellent results.

HERNIA OF THE FEMALE INTERNAL GENITALIA THROUGH THE INGUINAL CANAL

By H. W. Hewitt, M.D., Detroit, Mich.

HERNIA of the female genitalia through the inguinal canal is of relatively rare occurrence, yet it is of sufficient practical importance to justify consideration at this time. In 1905 and 1906 Frank T. Andrews,[1] in three exhaustive articles, tabulated all recorded cases to that date, the tabulation being as follows: hernia of the tube, 46 cases; hernia of the ovary and tube, 82 cases; hernia of the ovary, 167 cases; hernia of the uterus (gravid and nongravid), 76 cases. Total, 371 cases. In 1907 Carstens[2] reported two cases of his own and collected 8 additional cases, classified in the following manner: hernia of the ovary and tube, 4 cases; hernia of the ovary, 5 cases; hernia of the uterus, 1 case. In 1912 Heinick[3] reported three cases of his own and collected 12 other cases as follows: hernia of the ovary, 2 cases; hernia of the ovary and tube, 12 cases; hernia of the uterus, 1 case. In 1913 Farrar[4] added three additional cases of hernia of the uterus. Since 1913 the writer has been able to find 10 authentic cases, as follows: hernia of the tubes and ovaries, 5 cases, Rabinowitz,[5] Müller,[6] Daniels,[2] McClanahan,[8] Royster;[9] of the uterus, tubes and ovaries, 4 cases, Priami,[10] Santoro,[11] Barr,[12] Ludington;[13] of the tube alone, one case, Guiliano.[14] These, with the author's case, bring the total of recorded cases to 411.

The writer desires to place upon record the following case: Mrs. S., aged forty-nine years, Lithuanian, married twenty-seven years, mother of nine children. Menstrual periods regular until six months ago, since which time the flow has been irregular and profuse. Her labors were short, averaging one hour. Delivery normal in each instance. With the exception of an occasional headache, her past history has been negative. History of present illness dates from 16 years ago, when she gave birth to a baby girl. Immediately following this delivery she was seized with severe pain in the left lower quadrant of the abdomen and noticed a small protrusion in the left inguinal region about the size of a hen's egg. This could be returned with ease, at times disappeared entirely, and caused her no pain or discomfort during the following fourteen years. Two years ago she was seized with pain in the left lower quadrant of the abdomen, which lasted for two weeks. This confined her to her bed at that time. She also noticed that the growth was increasing in size, assuming that of a large orange. Later it was determined that this increase in size was due to pregnancy. After labor the protrusion in the inguinal area persisted and gradually increased in size until operation. She states that it caused her no disturbance, with the exception of a sensation of traction in the region of the tumor. Operation was performed April 18, 1921. A tumor the size of a small fetal head was present in the left inguinolabial region. There appeared to be fluid in the tumor, so the preoperative diagnosis was hernia of an

ovarian cystoma. An incision was made over the inguinal canal extending downward onto the labium majus. On opening the sac what appeared to be a thick walled ovarian cyst presented. Removal of the cyst without disturbing the fluid was attempted, but because of firm adhesions to the uterus, was abandoned. After the fluid was evacuated, an effort was made to remove the cyst but adhesions to the uterus were so firm, with no visible or palpable line of cleavage, that the best course seemed to be the removal of the uterus also. This was done, herniotomy performed and the patient made an uneventful recovery. A note from her physician dated September 1, 1922, states that she feels well, has a good result from her herniotomy and is entirely relieved of all her symptoms.

Fig. 1.—Female internal genitalia removed from a hernia of the inguinal canal.

A description of the specimen by Dr. Clarence Owen, pathologist to Grace Hospital, follows:

The specimen consists of uterus, adnexa and a cavity, the latter placed with its floor on the fundus of the uterus (Fig. 1). The entire specimen is conical in shape, with the apex at the cervix. From the base to apex measures 19 cm. The base measures 8 cm. The uterus and cervix are considerably enlarged. The body of the uterus measures 7 cm. from the fundus to internal os, and 1 cm. in its greatest diameter. The wall is 3 to 4 cm. in thickness. The cervix is 4 cm. long and from 1 to 3.5 cm. in transverse diameter. The cavity of the uterus is practically obliterated. The fallopian tubes are both enlarged, tortuous, and embedded in a dense mass of fibrous tissue: the left is 9 cm. long, the right 6. Both end in fimbriated extremities, which are in apposition to their respective ovaries. The ovaries are likewise embedded in fibrous tissue, are recognized only on microscopic examination and measure 1.5 to 2 cm. in diameter. The right ovary contains what appears to

be a corpus hemorrhagicum about 0.75 cm. in diameter. The lumina of the tubes were not traced, it being impossible to pass a probe. Sections were made at different portions of the tube, the lumen found to be from .5 to 1.5 mm. in diameter. The diameter of the tubes varies from 1 to 2 cm. The tubes blended insensibly into fibrous tissue involving the ovaries and the cavity. The cavity above mentioned is spherical in outline, from 7 to 8 cm. in diameter. The floor is formed by the fundus of the uterus and portions of the tubes, the ovaries and a fibrous tissue wall. This fibrous tissue wall is from 5 to 8 mm. in thickness. On the external surface of the wall, superiorly and posteriorly, there is a covering of peritoneum. The cavity is lined throughout with dark brown pigmented substance from 0.5 to 1 mm. in thickness.

Microscopical Findings.—Cervix: There is marked glandular hyperplasia of the cervical mucosa, the wall of the cervix being markedly fibrosed, with areas of small, round infiltration. Considerable hypertrophy of the uterine mucosa is found with a concomitant hyperplasia of the glands. The walls of the uterus are thickened with fibrous change and numerous areas of round-celled infiltration are noted. Fallopian Tubes: A small amount of transverse and longitudinal muscular wall remain embedded in a mass of chronic granulation tissue. The plicae of the mucosa are obliterated and all that remains of the mucosa is a layer of simple columnar epithelium. The mucosa is separated from the muscular wall by chronic granulation tissue, about 2 mm. in thickness. The latter is composed of old fibrous tissue with many blood vessels, and numerous areas of small round cells, a few eosinophiles and occasionally a group of cells containing large mononuclear wandering cells. The ovaries are senile in type, containing several corpora albicantia. The stroma is atrophic and there is a marked fibrosis with chronic granulation tissue. In the right ovary, an encapsulated area of hemorrhage is seen about 1 cm. in diameter, surrounded by a distinct fibrous tissue capsule. This in the gross appearance resembles a corpus hemorrhagicum and granulation tissue in which the tubes are embedded. The lining of the cavity has a layer of old hemorrhage. The cellular infiltration is abundant, consisting of plasma cells, small red cells, and eosinophiles showing some tendency to localization around the vessels.

Etiology.—It has been stated that every organ within the abdomen, with the exception of the liver and the pancreas, has at one time or other been found in the sac of an inguinal hernia. If the ligamentary supports of the uterus, tubes and ovaries are sufficiently lax, one of the factors in the etiology of inguinal hernia is present, the other factors being a patulous inguinal canal and intraabdominal pressure. Let us consider for a moment one of these factors, viz: the patent inguinal canal. There is still some disagreement as to whether or not the canal of Nuck is analogous to the processes vaginalis in the male. Carmichael[15] considers this doubtful. Others believe the analogy to be true. At all events persistence of the canal of Nuck has been shown to be an important factor in the etiology of this form of hernia in women. In the third month of fetal life, the ovary passes from its position below the kidney downward into the pelvis. In 75 per cent of children, the canal of Nuck is obliterated at birth. Carmichael believes that persistence of this process of peritoneum is associated with malposition of the ovary in 30 per cent of cases. Imperfect development of the ovary, tube or uterus is frequently

associated with inguinal hernia and is looked upon by some writers as an important etiologic factor. In fact not a few of the herniated ovaries in young girls have been found by microscopic examination to be not ovaries but immature testicles. In the androgynous type of hermaphroditism, inguinal hernia is frequently present and the sac has been found to contain female genital organs in a number of instances. Corner made a study of inguinal hernia in female children and makes the observation that "irreducible hernia in female children is almost sure to contain some of the internal genitalia, while in the adult, though it may be present, it is very unlikely to be." The ovary and tube do not, as a rule, lie free in the sac but are adherent or are intimately associated with the sac, giving further confirmation to the theory of congenital origin of these herniae. Andrews[1] states, "that imperfect development of the uterus is likely to be associated with a congenitally open inguinal canal" and "nearly all, if not all, of the inguinal herniae of the uterus have some congenital defect as the primary cause."

Inguinal hernia is five or six times less frequent in the female than in the male. Royster[18] gives the following reasons for this: 1. Women are less given to hard straining labor. 2. The canal of Nuck is smaller and the round ligament less bulky than the corresponding structures in the male. 3. The internal oblique occupies a lower position and this protects to a greater extent the internal ring. 4. The internal ring occupies a higher position than in the male. Coley[19] collected a series of 59,404 cases of inguinal hernia, 9082 occurring in the female. From the Mayo Clinic Judd (quoted by Coley) reports in a series of 1429 cases, 119 females. Direct inguinal hernia in the female is rare. In Coley's[19] series of 353, only two were direct, (about 0.6 per cent) while in 1775 cases in the male, fifty cases were direct, or about 3 per cent. Hernia of the tube, without the ovary or uterus, comprises 10 per cent of the cases; hernia of the ovary 50 per cent; ovary and tube 20 per cent; the nongravid uterus 12 per cent; the gravid uterus 8 per cent. In hernia of the uterus, the ovary and tube of one side are usually carried down into the sac. Hernia of the tube alone is not infrequently brought about by an hydatid of Morgagni, first getting into the sac and bringing the tube after it. Bilateral hernia of the ovaries and tubes has been found simultaneously in the same individual. Carmichael[15] has cited thirteen such cases, and states that: "This tendency seems to be more marked the younger the subject." Cases have been reported where the ovary and tube of one side have been diagnosed and removed only to be followed by hernia of the other tube and ovary on the opposite side. Farrar[4] mentions a case of bilateral inguinal hernia of a bicornuate uterus, one horn in each sac. Further, as Andrews

points out, by adhesion to intestine or omentum the pelvic organs may be fixed in a position favoring entrance into a preexisting sac. The genital organs do not necessarily lose their functional activity by hernial displacement so that menstruation may continue with more or less regularity. Pregnancy has not infrequently taken place in a herniated uterus, as Andrews cites thirty such cases. When, however, the ovary is herniated before puberty and is irreducible, full maturation and development are not likely to occur. Further, the mobility of the ovary leads to torsion of its stalk with consequent interference with venous return, and attacks of congestion which may destroy the ovary entirely. Hernia of the ectopic tube occurs only occasionally. In Andrews' series of 371 cases, this was noted only five times.

Pathology.—The genitalia in the sac may be normal except as to position. In irreducible ovarian hernia in children, changes take place in the ovary due to pressure or to torsion of the mesoovarium, resulting in serious injury to the ovary, as stated above. Adhesions, strangulation, inflammation, infection, tumor, pregnancy, either tubal or uterine, may be encountered.

Symptoms.—In the simpler forms these are no different from those seen in the intestinal or omental types. In the complicated types, the symptoms may vary from mild discomfort to a distress very much pronounced. The symptoms will depend upon the age of the patient, the genital organs involved, the type of hernia, whether simple, irreducible, incarcerated, or strangulated, and malformations, adhesions, infections, tumors, or the presence of other organs in the sac.

Diagnosis.—This form of hernia is rarely encountered, hence is unsuspected and frequently not diagnosed until operation. As Lejars[20] states: "These hernias are almost always surprises." Hernia of the ovary in young children should not be difficult of diagnosis, for as Corner remarks, the diagnosis is more than suggested by the fact that these forms of hernia are usually irreducible and when irreducible the ovary and tube may be easily felt. When the hernia is strangulated and shows no impulse on crying, the diagnosis is easily made by the nontranslucence of the swelling and the absence of symptoms of bowel obstruction. Hernia in the adult female is usually acquired, although a patulous canal of Nuck is present in nearly every case. In the adult female, the diagnosis presents greater difficulties, especially in cases where a small ovarian cystoma is present in the sac, which latter may be readily mistaken for hydrocele of the cord. Hernia of the tube alone is very difficult to make out, but hernia of the uterus is comparatively easy. The hard uterine tumor in the inguinal region and inability to palpate the uterus in its usual location should be sufficient to make one suspicious of the condition present. Differen-

tial diagnosis must be made from hydrocele of the canal of Nuck, epiplocele, small intestinal hernia, tumors in the sac, as fibromata, lipomata, carcinomata, etc., and especially tumors of the round ligaments; also from femoral hernia and undescended testicle in hermaphrodites. Treatment will depend upon the age of the patient, the organ herniated, the type of hernia whether (a) reducible, (b) irreducible, (c) incarcerated, or (d) strangulated, the contents of the sac and the complications present.

In hernia of the ovary and tube, when these are reducible and normal, they, of course, should be saved; if pathologic, removal should be practiced. If the hernia is irreducible the ovary should be preserved, provided it is normal and may be replaced without injury to its blood supply or without in any way weakening the herniotomy. In hernia of the uterus, between puberty and the menopause, this organ should be preserved unless there appears to be some very good reason for its removal, while in patients at the menopause the best procedure is to remove the herniated organs. When hernia is incarcerated, or strangulated, extirpation is necessary. These cases are but rarely encountered and the effort to make an accurate diagnosis will not infrequently put to the severest test the ability of the most skilled gynecologist.

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AN OPERATION FOR RETRODISPLACEMENTS OF THE UTERUS

By John W. Keefe, M.D., F.A.C.S., Providence, R. I.

I HAD the privilege last spring of witnessing a number of operations performed by Italian surgeons, both at Naples and at Rome, and I was greatly impressed with the dexterity and other accomplishments and the excellent technic which they practiced.

An operation performed by Professor Pestalozzi of Rome appealed to me as something out of the ordinary, and I thought you might be interested to know more about the details of this procedure. I also would appreciate an expression of opinion as to the value of this operation for the relief of retroflexion.

We are all familiar with the causes of retroversion, retroflexion and descensus of the uterus, and we know that several conditions may act as causative factors; consequently, no single method of operating can be applied to all cases and to bring about a cure, several operations for repair may be necessary.

The technic of the operation for the correction of retroflexion is as follows:

The patient is placed in an exaggerated Trendelenburg position. A modified Pfannenstiel, slightly curved, transverse incision is made through the skin and fat down to the fascia covering the recti muscles. This incision with its convexity toward the pubes, extends from a point one inch to the inner side of the anterior superior spine of the ilium, to a like point on the opposite side, on a line with the upper border of the pubic hair. The resulting scar will come in the fold of the lower abdomen, just above the pubes, and on account of the location of the wound it is scarcely noticeable.

It has been said, that the Pfannenstiel incision has been advocated principally for cosmetic reasons, as though these could be a matter of indifference, or minor importance to the patient.

Should we not make special efforts to avoid the unsightly scars so frequently seen, following the median incision, namely, the wide scar, the depressed areas, pigmentation, keloid, bulging from atrophy of muscular structures due to nerve injury; however, there are other advantages to the Pfannenstiel incision, the most important of which is the lessened tendency to postoperative hernia. Then, too, the convalescence is shortened, as the patient may leave the bed earlier and an abdominal binder is not required.

Continuing, the flaps are dissected upward and downward for a distance of about five inches. A second vertical incision is made near the median line, at right angles to the original incision, through fascia, rectus muscle and peritoneum. A careful examination is now made of the abdominal contents and any pathological condition found is corrected. When the uterus is replaced in the normal anteverted position the round ligaments are observed to be lax and of too great

length to be of material assistance in holding the uterus in the new, yet normal position.

The salient features of this operation are that the bladder is first detached from the anterior surface of the uterus and then sutured to it in such a manner, that the upper portion is attached to the upper anterior surface and fundus of the uterus.

The steps of the operation may be summarized as follows:

1. A transverse incision is made through the peritoneum, one-half inch above the upper attachment of the bladder to the anterior wall of the uterus.

2. The peritoneum and bladder are now separated from the uterus as far as the junction of the cervix with the vagina, in a manner similar to that employed in separating the bladder from the uterus during operations for hysterectomy.

3. The bladder is then pulled upward and attached by four interrupted chromic gut sutures passed through the bladder musculature and the anterior wall of the uterus at points just below a line drawn between the uterine attachments of the round ligaments.

4. The flap of peritoneum which was reflected just before separating the bladder from the uterus is fixed by four interrupted catgut sutures to the fundus of the uterus, or to the posterior part of the fundus.

5. The abdominal wound is closed with a continuous suture of catgut in the peritoneum, a double chromic catgut suture in the fascia, plain catgut in the fat and interrupted dermol sutures in the skin.

The operation of freeing the bladder from the uterus and raising it, so that it pulls upward the anterior wall of the vagina, aids in the cure of retroflexion, vesicocele and slight prolapse of the uterus.

When I first considered this operation, I realized that the round ligaments were lax when the uterus was brought forward so I devised the following technic for shortening the round ligaments:

An incision two inches in length is made through the peritoneum covering the uterus and round ligaments, the center of which incision lies over the insertion of the round ligaments into the uterus. The edges of peritoneum along the incision are retracted and the uterine portion of the incision deepened sufficiently to receive the round ligament about to be embedded in it.

The round ligament, freed of its overlying peritoneal covering, is now grasped with forceps and drawn taut in the direction of the uterus, thus taking up the slack. The loop of round ligament resulting from this procedure is fixed in the slit in the wall of the uterus, by three or four chromic gut sutures. The peritoneum is then drawn over the ligament and united with a continuous, plain catgut suture. The opposite round ligament is treated in a similar manner.

CONCLUSIONS

Attaching the bladder to a higher position on the uterus has the effect of holding the uterus in a normal, anteverted position and of raising the anterior vaginal wall.

Shortening the round ligaments by the method here advocated has the advantage of retaining the original attachments of the round ligament, so that traction upon the fundus of the uterus is normally applied.

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DISCUSSION

DR. JOHN OSBORN POLAK, Brooklyn, New York.—I saw this operation performed by Rossini a number of years ago, and it has a field in covering myomectomy wounds; but I should like to call attention to one point, namely, carrying the bladder up high does not keep the uterus forward, as has been shown by the experience we have had with the operation known as the Krönig cesarean section, where the bladder attachment is carried away up on the face of the uterus. I have seen any number of cases come back with their uteri retroverted.

I believe the cure of the retroversion is accomplished by his procedure in shortening the round ligaments, and, of course, there is an advantage in preventing peritoneal adhesions by carrying the normal bladder peritoneum over the face of the uterus. There are times when this procedure should be utilized just as I have suggested, for covering myomectomy wounds, bruises in front of the uterus, but as a cure for retroversion, unless supplemented by shortening of the round and uterosacral ligaments, it will fail because it is wrong in principle.

DR. HERMAN E. HAYD, Buffalo, New York.—Dr. Keefe has brought to us an operation that is very interesting, but after all the different operations we have performed for retroversion, and after the successes all of us have had with these operations and the failures which we have been able to attribute to them, I am surprised that he should try to establish this procedure which, first of all, slits the peritoneal covering of the uterus then tears it back and then doubles over the ligament and inserts it into the slot thus formed. No matter how carefully it is sewed over, it leaves a rough spot for future adhesions. He also separates the bladder from the front wall of the uterus which may make a number of permanent striae and folds, and be responsible for a great deal of future irritability of the bladder. I have advocated and employed for many years, plication of the round ligaments and then shorten them just as this Italian surgeon does. Then I sew the uterine end of the ligament into the cornu of the uterus to get a very strong attachment; of course, always being careful not to kink the tube and not to include too much of the ligaments in the bite of the ligature. Then a catgut suture, which will last only a few days is passed through the uterus to hold it up. If the uterus is heavy, it relieves the tension on the plicated area and when there is much sagging of the broad ligament, I insert a few stitches through the uterosacrals. We thus accomplish all that is necessary in the way of extending and elongating the anterior wall of the vagina and we will have occasioned the least amount of traumatism which is productive of so much future suffering from the subsequent intraperitoneal adhesions. A prolapsed ovary should likewise be lifted into place with a suture of fine catgut.

DR. JAMES N. WEST, New York City.—I have recently operated on a patient on whom this operation was done about eighteen months ago. I judge the peritoneum of the bladder was fixed to the fundus of the uterus. She came to the dispensary on account of frequent micturition. We found that the uterus apparently was drawn down by this attachment of the bladder until there was a marked procidentia. The uterus was small and the effect on the retroversion was not appreciable. I tried to do an interposition operation, but found that the bladder fold of peritoneum was too firmly attached to the top of the uterus.

DR. MAGNUS A. TATE, Cincinnati, Ohio.—In this operation described by Dr. Keefe, I would like to know what becomes of the bladder if the woman should become pregnant?

DR. JAMES F. BALDWIN, Columbus, Ohio.—I have for a good many years used a modification of the Pfannenstiel incision, in cases in which the patient is

very anxious to avoid a scar. The modification consists in cutting down to the aponeurosis, dissecting up the flap, and then making the usual median incision. The flap is then brought down and attached to the aponeurosis by under-sewing back and forth with plain catgut, then closing the first incision with two or three silkworm-gut stitches above the pubes, and the rest with catgut, taking in just the skin. The results, so far as avoiding scar is concerned, have been exceedingly satisfactory.

A number of years ago I advocated elevating the uterovesical fold when operating for the relief of long-standing retroversion. In these long-standing cases the bladder and uterus have pulled from each other so that the bladder is attached down on the vagina and not at all to the uterus. In such cases I cut across the peritoneum, very much as advised by the essayist, dissect the bladder from the vagina with the fold of peritoneum, then reattach the peritonium as high up on the anterior surface of the uterus as it seems wise. No stitches are put into the bladder but it is brought up into approximation and takes care of itself. The chief argument which I advanced in favor of this operation was that it eliminated the deep pocket from in front of the uterus. The intestines thus would not tend to push the uterus back. The round ligaments are shortened of course as necessary.

DR. CHARLES L. BONIFIELD, Cincinnati, Ohio.—I wish to call attention to the fact that while the object is accomplished in a new way, the principle is old. It is the same as that employed by Dührssen and Winter in connection with vaginal fixation in 1892 of bringing the uterus forward. It is the vagina that holds it forward, and not the bladder. The vagina is a stronger and more fixed organ, and if the uterus is held forward, it is done by the vagina and not by the bladder, and not by the peritoneum which will not hold anything.

This operation and all operations that shorten the round ligaments intraperitoneally have the disadvantage brought out by Dr. West, namely, they pull the uterus downward and forward instead of upward and forward where we want it. The only operation that pulls it upward and forward is the Gilliam operation or some modification of it.

DR. DAVID W. TOVEY, New York City.—I do not see the advantage of the modification of the Pfannenstiel incision that is referred to by Dr. Keefe. One of the principal advantages that Pfannenstiel claimed for his incision is to prevent hernia. If you cut through the fascia vertically under the skin, you have nothing but the skin to hold the intestines back and I do not see why we should not produce a hernia with this incision the same as with a vertical incision. Stanton, of Schenectady, collected the statistics of a number of large hospitals of the country and found from 2 to 10 per cent of hernias following the vertical incision in clean cases. Pfannenstiel up to the time of his death had published 5,000 cases in which his incision was used without a hernia. I know of only one case operated on by the Pfannenstiel incision in fourteen years that was followed by hernia, and that was a case of carcinoma where a large abdominal drain was left in and hernia followed. If you make the incision and dissect up a flap and do not cut all branches of the twelfth nerve that go to the fascia and supply it, you will not produce a hernia. In separating the fascia from the rectus you get rid of the rigidity in the recti and can draw the recti to the spines of the ilium so that you have taken all tension out of it.

It has been pointed out that one of the disadvantages of the Pfannenstiel incision is that it presents difficulties if infection sets in. Such is not the case. I find the incision heals more kindly than a vertical incision, because the fibers of the skin and fascia run transversely and tension causes the wound to close. If the

patient during the operation should strain or vomit, you will see the incision come together.

DR. ROBERT T. MORRIS, New York City.—A great many abdominal operations may be done in fifteen minutes through the short incision. You cannot do that with a Pfannenstiel incision. In the second place, if you have a patient who does not relax, whose abdomen is rigid as sometimes occurs, it is difficult to make a very good repair if the Pfannenstiel incision is employed. In the third place, every operator gets primary union, but the other fellow does not. I have had to repair two cases in which infection occurred after a Pfannenstiel operation. Both of these patients have been reported as cured by the original operator, but they are not yet cured.

DR. RUFUS B. HALL, Cincinnati, Ohio.—I cannot see the logic of why we should repair the round ligament and leave stitches when it is feasible to shorten the round ligament by modification of the Gilliam operation, and bring the external part of the ligament through the inguinal canal; that does all that can be done, and leaves the patient's abdomen intact, so far as the round ligaments are concerned.

DR. KEEFE (closing).—Professor Pestalozzi told me he had performed this operation more than one hundred times with success.

It is natural for men who have not done an operation to condemn it theoretically, whereas the other fellow who has done a hundred of these operations may see the value of it. I was impressed with the skill with which this man operated, and I feel this way about it myself: that in women in the childbearing period it may not be well to put the bladder on top of the uterus. In women beyond that period I think it might be so utilized.

It is said that the vagina holds the bladder up; others say it is the floor of the pelvis that holds the uterus up.

I showed a picture in the beginning of my paper of a normal uterus lying right on the fundus of the bladder. If we insert two or three stitches, uniting the bladder to the uterus, then when the bladder is filled the uterus is raised; but normally it is resting on the bladder. I have not heard anyone put forth any convincing argument that this procedure is not of value.

I was very much impressed, and am yet, with the Alexander operation. A great many men say, you must open the abdomen; you may find something the matter with the tubes or ovaries. I believe that a specialist in gynecology ought to be able to determine whether there is any serious trouble with the tubes or not. If he cannot make it out, he had better not do abdominal section. There is a large field for an operation like the Alexander operation. It has been my privilege to have listened to some eminent gynecologists of earlier days when the operation of shortening the round ligaments by the Alexander operation was first developed. Professor Polk was one of the men who advocated it. Professors Munde, Lusk, Emmet, and others advanced arguments to the effect that the round ligaments had nothing to do with it. Emmet would not say that they had a lifting up property. Whenever you use the Gilliam operation and hold the uterus up to the abdominal wall, it is not a natural position at all. The nearer we come to what nature has done, the nearer we will come to something that is worth while. When we shorten the round ligaments in the way I have suggested, so that we are nearer the attachment of the round ligament to the uterus, that is the place to have it. Nature does not push it up to the anterior abdominal wall. It is said that subsequently the patient will have a lot of bladder symptoms. I have only operated twice by this method, and these patients

have not had bladder symptoms. We do this same thing when we perform a hysterectomy, separate the bladder from the uterus, do a supravaginal amputation, and stitch the bladder to the peritoneum on the posterior wall and the stump of the cervix. How many patients have bladder symptoms after doing that?

I am glad the operation I have described has brought out such a free discussion. I desired to obtain the ideas of some of you whether the operation is of value. I wrote Professor Pestalozzi as to whether he had published the results of this operation. I wrote him six weeks ago, but have not received a reply. I shall follow the operations up and see whether we can find any detailed report of his cases and what the subsequent results are after operation.

Concerning the two cases I have described, I still feel that I shall continue to do more of these operations and follow the cases up and see whether they develop bladder difficulties or not. When I saw this operation performed it struck me as something worth while, and I thought I would present it to you.

THE PRESENT STATUS OF SURGERY IN THE TREATMENT OF FIBROMYOMATA UTERI

By Stephen E. Tracy, M.D., F.A.C.S., Philadelphia, Pa.

THE status of any method of treatment is determined by the end results. The technic of myomectomy and of hysteromyomectomy has been so carefully and thoroughly worked out and the results both primary and secondary have been so uniformly satisfactory that we can scarcely hope for much improvement.

Other forms of treatment to secure recognition must be simpler in application, more conservative, or yield better results; if not in all cases, then in a certain type of case.

In the last five years much has been written on the treatment of these neoplasms by radiotherapy and especially by radium. Some authors make the claim that 60 per cent or even a higher percentage of these cases, as the surgeon sees them, can be successfully treated with radium.

In order to determine whether these sweeping statements are founded on facts, it will be necessary to consider the pathology of these tumors and of the neighboring structures and then to compare the results.

This discussion is limited to those neoplasms which produce symptoms and require treatment. The symptomless tumor requires no treatment, but should remain under observation.

It is a well-known fact that 30 per cent of patients with fibromyomata uteri, as the surgeon sees them, have either a degeneration of the tumor or a malignancy of the pelvic organs. The degenerations in the tumor are nearly twice as frequent in patients who are past the age of forty years and 90 per cent of the malignancies occur in women who are over this age. The vast majority of the malignancies in the uterus which contain fibromyomata, are found in the corpus and not in the cervix; just the reverse of what is found in women who do not have fibromyomata. This situation would seem to indicate that the fibromyomata by some method or means predispose or cause a malignancy to develop in the corpus.

The percentage of degenerations in the tumor and of the malignancies in the pelvic organs which are found will depend to some extent on the care with which the specimens are studied histologically.

Lesions of the abdominopelvic organs are so frequently associated with fibromyomata uteri that they must be studied carefully when considering the treatment of these neoplasms, if we wish to eradicate

all the pathology and relieve the patient of all symptoms. Anything less than this is a makeshift and is neither scientific nor satisfactory.

Associate lesions are found in 40 per cent of cases. When we add 40 per cent of associate abdominopelvic lesions and 30 per cent of degenerations and malignancies, we have 70 per cent of complicated cases. In my series the complicated cases were 77 per cent.

Of the patients subjected to operation in addition to the removal of the neoplasms, many were operated upon at the same time for lacerations, hemorrhoids, fistulae, diseased gall bladders, appendices and other lesions. In spite of all of these various complications, by surgery we relieve the patient of all symptoms in from 96 to 98 per cent of cases. The mortality from operation on patients with fibromyomata uteri, by good surgeons in well-equipped hospitals, is about 2 per cent. These operative cases include those with the various degenerations, the densely adherent tumors, the malignancies which coexist and all the serious associate conditions. If the surgical mortality in all cases as they come, is only 2 per cent, in simple uncomplicated cases, it would be practically *nil*. In other words, simple uncomplicated tumors such as are suitable for treatment by radium, can be treated by myomectomy with practically no mortality; complications which occur after treatment by radium, due to the impossibility of determining certain pathologic lesions, will be eliminated and "cooked tissue to await an uncertain future" will not be left in place. Polak states, "the increased blood pressure and nervous phenomena are more pronounced after radium than after operation."

With the improvements in technic which eliminate the possibility of hemorrhage or of a necrosis in the sutured area, the field of myomectomy has been greatly enlarged. Knowing that a menorrhagia or a metrorrhagia can be successfully controlled by radiotherapy, should it occur after a myomectomy, there is no doubt that the operation will be done more frequently in the future.

It is quite agreed by surgeons and radiotherapists that radium should not be used in the presence of malignancy if the case is operable. This is certainly true in carcinoma of the corpus uteri and of the ovary and it is debatable in early carcinoma of the cervix uteri, nor should radium be used in submucous or large pedunculated subserous tumors, in degenerated tumors, in calcified tumors, in tumors associated with lesions of the appendages; in tumors which produce symptoms from pressure and require quick relief, nor finally in tumors associated with gestation. Miller states, "that patients who complain of pain associated with fibromyoma, are usually not relieved of that symptom when treated with radium."

Who can diagnose all of these conditions by any method of examination? The surgeon certainly cannot. The pathologist sometimes

overlooks a malignancy and the condition is not detected until the patient returns with a recurrence. The more competent roentgenologist will not treat these patients unless they have been examined by a gynecologist or by a surgeon. They realize the difficulty in diagnosis and pass the responsibility over to the surgeon. An early gestation in one corner of the uterus gives the organ an irregular contour and may be readily mistaken for a fibromyoma. The difficulty of a differential diagnosis between a gestation and a soft myoma can be attested by the humiliation at the operation table of even the most expert. An error in diagnosis may readily occur from a distended bladder or a loaded sigmoid. And again, fibromyomata are not infrequently diagnosed when they do not exist. That the radium enthusiasts cannot determine with any degree of accuracy what are simple uncomplicated cases is evidenced by the number of patients who subsequently require operative treatment, by those who develop complications and by an occasional fatality.

When we eliminate the patients under forty years of age and the complicated cases over forty years of age, there remain only 16 to 18 per cent of patients with simple uncomplicated tumors which make it apparent that the legitimate field for radiotherapy is decidedly limited.

Radiotherapists place especial emphasis on the production of amenorrhea, which is simply the elimination of one symptom. They talk about the shrinkage of the tumor in many cases, but most of them carefully avoid stating in what percentage the tumor disappears.

In Kelly's series the tumor had either disappeared or shrunk to an insignificant size in only 45 per cent of the cases. Miller states, "that the diminution in the tumor is usually more than 50 per cent; that the growth is frequently reduced to a negligible affair and often entirely disappears." Pfahler, in a series of 67 traced cases treated with x-rays, reports 75 per cent of absolute cures. While this series is not large, it indicates that he exercised excellent judgment in the selection of his patients and apparently limited his treatment to simple uncomplicated cases.

It is undoubtedly true that the bleeding can be controlled in almost every case by radiotherapy, but as Mayo states, "one cannot escape the conviction that in cases of myoma the use of radioactive substances is a most destructive method of treatment, nonoperative it is true, but certainly not conservative. In the majority if not in all of the cases in which rather large myomata disappear under their use, the patient loses the function of the ovaries, tubes and uterus, although the nonfunctionating remnants are left in place to await an uncertain future."

While this paper does not deal with myopathic hemorrhage, I be-

lieve that a patient at or near the menopause with an enlarged fibrous uterus, with menorrhagia or metrorrhagia, should be treated by radium rather than by surgery.

When we recall that 70 per cent of the cases of fibromyomata uteri are complicated, that in all of the patients subjected to operation not only are the tumors removed, but also the abdominopelvic pathology is eradicated and that from 96 to 98 per cent are cured of all symptoms, it is evident that surgery is the treatment of choice. Conservative myomectomy should be done in women under forty years; supravaginal, and when indicated, panhysterectomy in women past the age of forty years.

Radium undoubtedly has a field, limited though it is, in the treatment of these tumors. The pioneers in this work are to be commended for their effort and for their enthusiasm. Only by faith and experiment can the new be developed and progress made. This enthusiasm, however, in the best interest of the patient, must be tempered with sound judgment and applied by the Golden Rule.

Radium may be safely used in these cases as follows:

1. In simple uncomplicated, small or medium size tumors causing hemorrhage at the menopausal period.

2. In patients with menorrhagia or metrorrhagia after myomectomy.

3. In patients whose general health is so impaired from any cause that an operation would be attended with undue risk.

A broader application of radium or x-ray means that the best interest of the patient is not receiving sufficient consideration.

When we consider all of these factors it is evident that surgery is the treatment par excellence in the vast majority of patients with fibromyomata uteri which produce symptoms.

SUMMARY

1. Of all the patients who consult a surgeon for symptom-producing fibroids, 30 per cent have either degeneration of the tumor or malignancy of the pelvic organs.

2. Abdominopelvic pathology is found in 40 per cent of the cases.

3. Seventy per cent of these patients have complicated tumors.

In women past the age of forty years only 16 to 18 per cent have simple uncomplicated tumors.

4. It is impossible by any method of examination to determine which are simple uncomplicated tumors.

5. The treatment of choice in the vast majority of cases is myomectomy for women under the age of forty years and hysterectomy in women past this age.

6. That radium has a definite though limited field of usefulness in the treatment of these neoplasms.

7. (a) That the use of radium should be restricted to small or medium-sized uncomplicated tumors at the menopausal period.

(b) To a patient with menorrhagia or metrorrhagia following myomectomy.

(c) In certain constitutional diseases in which surgery would be attended with unusual risk.

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DISCUSSION OF PAPERS BY TRACY AND WEISS

DR. JOHN OSBORN POLAK, Brooklyn, New York.—There are two or three points in connection with these papers that I want to discuss. The point Dr. Weiss makes of the importance of diagnosis in cases in which radium is used is one we all admit, but we also must admit the impossibility of making an absolute pathologic diagnosis in certain cases of fibroids when we realize the number of degenerations that actually take place in these tumors. Therefore, I do not believe that any one will convince us for some time that radium is a panacea in fibroids, and that operation is to be excluded. I do believe, however, that there are a large number of fibroids and conditions met with in women with fibroids that are amenable to radium treatment. Within the last year a woman came under my observation with a fibroid as large as a four months' pregnancy, with hemoglobin of 12, whose coagulation time was 18 minutes. She was treated with a single dose of radium for 1200 mg. hours, and the hemorrhage was controlled. This was done as a temporary expedient, and followed by transfusion. The tumor has entirely disappeared. Such an instance as that makes one feel that there is a field in a certain limited class of cases for radium.

In hemorrhages of young girls, who have had repeated curettings, with particularly soft cervices the pathological examination is practically negative. Repeated hemorrhages will so reduce the patient's coagulability and blood condition that something has to be done. Repeated small doses of radium have a large field in these cases. Some of these cases will bleed so profusely that their hemoglobin is reduced to 20 or 30, and the coagulation time will be increased to such a point that we cannot control the bleeding, and yet with 200 milligram hours, or 400 milligram hours of radium we can and do control the bleeding.

The question comes up, does the use of radium in these young girls have an influence on pregnancy? In our experience with a number of these young girls who have subsequently married, four pregnancies have occurred. None of these had radium for periods of longer than 600 milligram hours. Personally, I believe that small applications of radium have a definite effect on the uterine structure, particularly the basal membrane underneath the mucosa, and that in such dosage it does not affect the ovarian function.

There is one point in Dr. Tracy's paper in regard to hysterectomy concerning which I wish to speak. He limits total hysterectomy to patients over forty. It should be extended farther than that; it should be extended to those women who are the subjects of cervical disease, extensive trauma of the cervix, or chronic inflammation of the cervix. We were able to collect in America 256 cases, excluding the cases reported by Leonard, where cancer occurred in the cervix after the body of the uterus was taken out. These cases occurred after one year. We excluded all the cases reported where recurrence took place within a year, believing that the disease was in the cervix at the time of operation; consequently I believe that, everything being equal, where it is possible in a woman who has a traumatized cervix or an infected cervix occurring in the second period of her life, that woman should have a panhysterectomy, and not a subtotal hysterectomy.

DR. W. WAYNE BABCOCK, PHILADELPHIA, PENNSYLVANIA.—I was very glad Dr. Weiss brought out a strong warning against the indiscriminate and general use of radium, and particularly against the use of radium in young women and those during the period of childbirth. It seems to me, we should consider, as we always do, other measures that may, if possible, be used. There is one thing many of us have forgotten, namely, tuberculin, but for years I have been using this remedy with a great deal of satisfaction. Some of these young girls, who develop a uterine hemorrhage, are relieved if you simply take them away from their home surroundings, send them to the seashore, turn them out of doors, or send them to the mountains. Many of them are relieved without any change in the surroundings by giving them a terrific tuberculin reaction. This reaction has to be intensive. There must be a distinct temperature, and frequently the patient is ill enough to go to bed. As a rule, the effect passes off in three or four days. I have not seen any bad effects.

I was brought up in a laboratory where the fear of tuberculin was great, and the teaching of Virchow was such that for years I never thought of using it because I thought it was dangerous and improper. Then I began using tuberculin and increased it, and I have found in my experience in the last ten years no ill effects in patients who have had tuberculosis of the lungs or elsewhere. If you run through a series of cases, if you give these patients one milligram, two milligrams, or twenty milligrams, or forty milligrams to get the effect of tuberculin, you get results with a frequency that amazes you. These patients have a temperture of 101-3°; will lie down for a period; the bleeding from the reaction stops, and so, it seems to me, before we do anything in the way of local measures, these patients should be subjected to this rather simple and easily carried out measure.

An important matter is the mortality of hysterectomy for fibromyoma of the uterus. Dr. Tracy stated that it is 2 per cent. I think that is what it should be, but in the different hospitals of the country it is not what we find it. An associate looked over the mortality after hysterectomy in the hospitals at Philadelphia during the last two years. In one hospital where there was a splendid abdominal technic, the mortality was under 1 per cent, and it has been under 1 per cent for years. In most of the hospitals of Philadelphia, and it is true of the hospital where I work, the mortality ran from 4 up to 7 per cent. Not a few of them had 6 per cent.

I think the time has arrived when associations like this should ask hospitals, who run continuously a mortality of 5, 6, or 7 per cent for hysterectomy for fibroid of the uterus, why is this mortality permitted to continue?

DR. WEISS, (closing).—I did not present this paper to advocate or endorse radium but rather to condemn its indiscriminate use. Radium does shrink tumors at times. I did not take up that phase of the subject, because such extravagant claims are often made about the disappearance of fibroid tumors by radium that the statements sound ridiculous. We should be conservative about reporting our results so far as the shrinkage of tumors is concerned. There is one common symptom we can relieve with positive assurance, and that is the control of hemorrhage to the satisfaction of the patient, physicians and associates.

In reference to the use of radium in these handicapped bleeding patients, a minimum amount of time is lost by treatment. In a patient who has been debilitated or exsanguinated, it takes some time to get her in condition for operation; her convalescence is protracted, and it is difficult to get back to her normal condition quickly. When we consider that a large percentage of bleeding tumors occur in women who are employed as teachers or in stores, the loss of time is a considerable factor to them. Personally, I never tell a patient that she will be cured by radium; I tell her we are using this agent to relieve her of this prominent symptom, bleeding, and time alone will tell what will be accomplished, and to dismiss her after treatment and say that she is cured is rather unfair. Clark in his recent analysis, after five or six years' observation of these patients, has found no secondary results, such as sarcomatous and carcinomatous changes. No one can say definitely what will happen to the fibrotic shrunken uterus. We should follow up our radium patients as we do all carcinoma cases and tabulate the results, and then we will get scientific data.

DR. TRACY, (closing).—Many papers have been written on the treatment of fibromyomata uteri by radium, some of which have been so radical as to be decidedly misleading. It is necessary to work out what cases are suitable for radium and to put the treatment on a sound basis. There is no question that radium has a field of usefulness in the treatment of these neoplasms; simple uncomplicated cases in women past forty. To eliminate the complicated cases is a question of diagnosis, and diagnosis is the crux of the situation.

I agree with Dr. Polak, that if the uterus is to be removed and there is a diseased or traumatized cervix, a panhysterectomy should be performed. In some cases if the patient is a poor surgical risk, or if the operation would be unusually difficult, it has been our custom to do a supravaginal hysterectomy and then destroy with the cautery the functionating part of the cervical stump.

RADIUM IN THE TREATMENT OF UTERINE HEMORRHAGE OF NONMALIGNANT TYPE

By Edward A. Weiss, M.D., F.A.C.S., Pittsburgh, Pa.
(From the Gynecological Department, Mercy Hospital)

FOR several years there existed considerable skepticism in the minds of many as to the permanent value of radium in the treatment of uterine bleeding. The careful studies of John G. Clark, Bailey, Stacy and others have established beyond any reasonable doubt the efficacy of radium in the treatment of certain types of profuse bleeding of nonmalignant origin. The brilliant results obtained in some cases having been so pronounced, it is not surprising that the procedure would be abused by inexperienced persons using radium when not indicated, with the result that unfavorable reports have frequently been published.

With the broad experience of physicians and gynecologists of note to guide us, there should be no question as to the real merit of radium, and failure to appreciate it as a valuable therapeutic agent can be attributed to either prejudice or lack of experience. It is a fair assertion to make that no gynecologist is justified in withholding his willingness to consider the employment of radium in the treatment of selected cases of uterine bleeding. At the same time we do not subscribe to the statement that radium has supplanted surgery in the treatment of fibroids as in all probability there will still remain a large percentage of tumors requiring operation.

So convincing and complete are the reports of Clark and Norris in a recent analysis of their radium work that further comments would seem unnecessary, and while very little can be added to their conclusions, the reports from other clinics should be added to our gynecologic literature. A most careful and honest follow-up of the work from various gynecologic clinics should be tabulated for a long period of time in order to establish the status of radium and in a measure standardize the treatment. Our series of cases analyzed in this paper bear out to a large extent the observations of others. The results obtained were sometimes surprising and accomplished with wonderful ease as compared with operation, yet a critical attitude should be maintained and enthusiasm and optimism should not wean us from the well established operative treatment so successfully practiced for many years.

A series of one hundred cases in which bleeding was the only or chief symptom, were selected for this study. It does not include our

early cases when the technic was not definitely established and when mistakes in the selection of cases occurred, nor does it include cases treated during the past six months as not sufficient time has elapsed to tabulate these end results. In this group were eighty-three cases of submucous or interstitial myoma, four of adolescent bleeding with no pathologic findings and thirteen of functional menorrhagia or myopathic bleeding. Curettement as a diagnostic measure to exclude malignancy was performed and a careful selection of cases for radium treatment was made in every instance. When any doubt existed, operation was resorted to rather than radiation. With the exclusion of such doubtful cases, it follows that very few untoward or unsuccessful results were obtained. A rigid standard of indications and contraindications must be adhered to in order to obtain uniform results. The technic in every case was practically the same. The patient entered the hospital twenty-four hours before treatment, during which time the same careful physical examination was made and all routine urine, blood and Wassermann tests were completed, and the usual preoperative preparations likewise followed out. As the cervix is usually soft and patulous in these patients, due to the existing or previous bleeding, it is easily dilated, in which case an anesthetic is generally not necessary. In very nervous individuals the administration of morphia one-half hour before treatment was often sufficient, but in the presence of a rigid hymen or firm cervix, gas-oxygen was given. The depth of the uterine cavity, the size, mobility and consistency of the fundus was noted, a careful palpation of the adnexa made, a formal curettement was done and the curettings preserved for microscopical study. Radium needles of appropriate dosage, usually fifty mg., are screened in 2 mm. brass capsule and rubber tubing. Firm gauze vaginal packing to maintain the screened radium in the uterus is essential. In the average case the patient was kept in bed two or three days, but those more debilitated by long continued bleeding remained in the hospital longer in order to build up the general condition.

Eighty-three cases of the study were bleeding myoma. In selecting myoma cases for treatment, only those that were not larger than a three months' gestation were included. Intraligamentary or degenerating tumors were not considered suitable for radium. In spite of some favorable reports from other clinics, pedunculated tumors were also excluded in this series, likewise those suggesting degenerative changes were reserved for operation. Any evidence of inflammatory changes in the adnexa, either acute or chronic, contraindicated radiation. It has been repeatedly pointed out that chronic or latent adnexal inflammations are frequently excited to fresh reaction following

radium treatment. In our earlier series, two such instances were encountered with the result that a protracted convalescence ensued, after which radical operation was necessary. Six instances of rather large submucous tumors in uteri containing interstitial nodules were encountered. These projecting tumors were removed either by torsion or removed through a split cervix. In these cases the bleeding would in all probability have been arrested by operation alone, but radium was used not only to reduce the large, flabby uterus but to have an inhibiting effect on the remaining nodules. Curettings from one case showed an unrecognized carcinoma of the fundus. Radium had been introduced at the same time as polypoid endometritis had been diagnosed from the gross appearance. As we believe that fundal carcinoma is best treated by hysterectomy, radical operation was advised but this was refused by the patient. Repeated examinations have shown no recurrence of the bleeding after two and one-half years and it is fair to assume that the disease was arrested.

The most spectacular results were obtained in eight cases in which the blood picture was that of a severe secondary anemia due to bleeding myomata. Three of these cases presented a hemoglobin below thirty-five with accompanying low general physical picture contraindicating operation. Before the advent of radium in our therapy, such cases would of necessity require blood transfusion and much preoperative attention. With radium, the arrest of the bleeding was prompt with a rapid improvement of the patients' general condition. Two cases of this group of eight had a return of the bleeding within a year. The tumor had not decreased greatly in size but the condition of the patient was so good that hysterectomy was easily and safely performed.

In addition to the two cases mentioned, one other required operation, not on account of recurrent bleeding but for relief of persistent and aggravated pelvic pain, associated with occasional temperature. Operation disclosed an unrecognized secondary pyometrium due to unusual contraction and stenosis of the cervix following the radium. This is the only instance of its kind encountered. Some authorities believe that radium exerts its influence largely on the endometrium as well as on the ovaries. The mucous membrane of the uterus is destroyed by the direct effect of the secondary beta rays and while microscopical examinations of the endometrium in uteri removed after radium application have shown no definite necrotic changes, yet it is reasonable that such should occur. In discussing the action of radium on the uterus, Schmitz states that part of the endometrium receives an erythema or a first degree burn, another part a second degree burn and the portion in the immediate surroundings of the radium a third degree burn. Imperfect drainage through the cervical canal would

favor retention of the debris, and so favor the formation of pyometra. Since the occurrence of this complication in our series, it is the rule to explore the cervical canal to test its size and pathological state in all cases developing symptoms such as temperature or softening of the fundus after radiation.

Great care was exercised in using radium in women under thirty-five and whenever it was used, only minimum dosage was given. It is generally admitted that in women in the child-bearing age, myomectomy is the better method of treatment as it is not infrequent that even a moderate dose of radium produces menopause. In treating women who can and should have children, the child-bearing function of the uterus should be preserved. In this connection we venture to condemn in unmeasured terms, the unscrupulous and unprofessional employment of radium as a direct means to prevent conception by producing a premature menopause especially when no pathology is present.

The unexplained uterine bleeding in adolescence and young women has often taxed the skill of gynecologists, and its unsuccessful treatment has resulted in many deaths. Numerous explanations have been offered for this peculiar type of bleeding and while hyperfunction of the ovary has been generally accepted as a causative factor, yet the various remedies as glandular extracts, serums, styptic and curettements fail to arrest the bleeding. In the past, hysterectomy has often been resorted to in order to save the young woman's life, but the unfortunate sexless life of the individual resulting, is sometimes worse than death. With the advent of radium, an almost specific has been obtained, and while radium is more applicable in women at or near the menopause on account of the large dosage employed, yet with care and judgment, the excessive bleeding of the pubescent girl can be reduced and regulated. In our series four instances of profuse and almost uncontrollable bleeding were encountered. In one case the patient, a fourteen year old schoolgirl, with excellent physique and negative history, had three normal menstrual periods after which the flow became excessive and prolonged. Rest in bed, forced feeding, animal serum, various medications and uterine packing had little or no effect. The blood picture became so alarming that even hysterectomy could not be attempted. The insertion of 25 mg. radium screened in the uterus for eight hours arrested the bleeding and produced an amenorrhea for six months, after which the last two periods have been somewhat more profuse but the general condition and blood picture are practically normal.

A young woman of twenty-eight (a case of hemophilia) who bled excessively had been previously transfused. With a return of the uterine bleeding, radium was proposed and as she refused to submit

to the production of menopause, a minimum dose of 150 mg. hours was given. Great improvement was noted for six months with practically normal menstruation. After two rather free bleedings a second dose of 150 mg. hours resulted in a return to normal. A third case less severe in type required three doses of 25 mg. each for six hours before the menses became normal. It seems more conservative to resort to repeated small doses in young women rather than employ a single large dose. In other words a dosage of 1200 mg. hours can safely be used once in a woman after forty with pronounced result, yet in a young woman, 200 mg. hours used once or even three times if necessary would be efficient, and yet not necessarily rob her of the possibility of motherhood. Pregnancy has not occurred in any of the cases treated, yet with normal menstrual function, such possibilities are very favorable. Clark, Stacey and others have reported several instances of pregnancy following radium in minimum dosage, so that it is most important to keep such possibilities in mind when treating women in the child-bearing age.

The action of radium in controlling bleeding in myoma and myopathic conditions is an interesting study. Several explanations have been offered. Bailey believes it exerts its influence in three ways: (1) by action on the ovaries causing a destruction of the primary follicles. This would lead to a failure of ovulation and a consequent cessation of menstruation and would possibly lead to a retrogression of the growth similar to that which often follows the menopause. (2) By the destruction of the mucous membrane of the uterus through the direct effect of the primary and secondary beta rays. (3) By the effect of the gamma rays on the blood vessels leading to an occlusion or partial occlusion of their lumen.

Bleeding at the menopause in the absence of carcinoma, fibroid or other pathologic condition not infrequently gives rise to much concern both to the patient and physician and while this idiopathic bleeding rarely assumes serious proportions, yet the fear of possible malignancy is such that prompt relief is frequently demanded by the patient. In four of this series, the menorrhagia and metrorrhagia were pronounced. Gross pelvic pathology as well as cardio-vascular disease were eliminated as causes. The ages of the patients were forty-six, forty-nine, fifty-two and fifty-three respectively. Fifty mg. radium for twenty-four hours produced a complete cessation in every case. Curettings showed no hyperplasia or malignant changes so that atheroma of the uterine vessels was doubtless the underlying cause of the bleeding. The results obtained in this type of menorrhagia frequently classified as hyperplasia, fibrosis, uterine insufficiency or chronic metritis are so satisfactory that no surgeon is justified in resorting to radical hysterectomy to obtain a cure. It is certainly

not acting for the patient's best interests if he does not employ radium if procurable.

Not included in this series were four cases of fibroid bleeding that had been treated in other clinics without relief. Analysis of the history showed that very severe localized peritonitis followed the radium introduction and it was quite evident that a pre-existing adnexal disease was renewed by the radium treatment. This experience demonstrated very forcibly that a careful diagnosis and study not only of the tumor but existing complications is most essential. It is true, therefore, that the gynecologist and not the internist or roentgenologist should employ radium in the treatment of pelvic conditions, as the success or failure of its application depends primarily upon a correct and complete diagnosis.

In all cases receiving full dosage in this series, forty were relieved at once without return of the bleeding. Thirty-five menstruated once, fifteen menstruated three to five times, ten received two treatments. The irregular bleeding for the first ten days after treatment is not to be attributed to the radium but rather to the effect of the curettement, if not due to the disturbance of the ovarian hormone. It has been noted that a larger percentage had leucorrhea in varying amounts for the first two to five months. Frequently it has been very annoying and irritating, but generally is best relieved by douches of bicarbonate of soda. Probably the most annoying sequelae in our series has been nausea and vomiting while the radium is *in situ*. In many instances, it was attributed to the preliminary doses of morphia in those patients who were not anesthetized. However, the nausea was present in eighteen cases who received neither morphia nor gas, so that we have designated it "radium sickness" for want of a more definite explanation.

The decrease in the size of the uterus was generally not manifest before the tenth week after which the shrinkage became more pronounced. As a general thing, the menopause symptoms were more acute following radium than occurs normally but in most instances the administration of ovarian residue or corpus luteum helped to reduce the severity of the symptoms. The possibility of producing the menopause even with minimum dosage should be explained to the patient, especially younger women. In one instance the use of fifty mg. for six hours in a patient thirty-two years old produced a permanent amenorrhea with unusually severe menopause disturbance. The mental depression and disappointment was so acute that a serious nervous collapse followed, from which she is very slowly reacting but the sexual function is completely inhibited. The splendid results following radiation of fibroid tumors has unfortunately resulted in such a degree of optimism in some quarters that it is used in almost

every type of uterine tumor. This is most unfortunate as its indiscriminate use will often result in failure or aggravation of existing pathology. Only in exceptional circumstances as in the presence of serious heart or kidney lesion or grave constitutional disturbance when an operation would be extremely dangerous, is a deviation from the well established indications justifiable. The employment of radium to reduce a tumor larger than a three months' gestation is fraught with a certain degree of danger, neither should it be used in a tumor causing pressure and whose structure is purely fibroid or a dense hyaline or calcareous structure. It is granted that shrinkage of such tumors sometimes occurs, but with our present knowledge of distinct indication and contraindications the careless use of radium is not justified. Neither do we countenance its indiscriminate use to control uterine bleeding that is secondary to pyosalpinx or other adnexal disease. To clearly define our position therefore it may be stated that in our work the most satisfactory results were obtained in the treatment of one symptom only, namely hemorrhage, and we feel positive that radium used with care and clear discrimination has undoubted merit, acting almost as a specific and possessing the additional advantage of having almost negligible objections.

CONCLUSIONS

In the treatment of benign hemorrhage from the uterus the following observations are to be considered:

1. Radium should be used only in selected cases such as (a) myopathic bleeding of adolescence that does not respond to usual medical and hygienic measures; (b) myomata with bleeding as a symptom that are of small or moderate size and uncomplicated by adnexal disease; (c) menorrhagia of menopause.

2. The dosage depends upon (a) the age of the patient; (b) upon whether the function of child bearing is to be preserved or sacrificed.

3. Myomectomy in young women, and hysterectomy when the tumor is large or complicated should be done rather than treatment with radium.

4. Complications and unfavorable results are to be avoided only by a careful discriminating differential diagnosis.

5. All cases treated by radium should be carefully followed up for several years.

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UTERINE CARCINOMA AND ITS TREATMENT BY CONTINUOUS LOW HEAT

A Preliminary Report

By James F. Percy, M.D., Los Angeles, California

CARCINOMA is more vulnerable to the application of heat than to any other known agent that has so far been employed for its destruction. The difficulty is that we have not been wise in observing Nature's method of destroying the occasional case of cancer through the instrumentality of heat. Had we done so we would have learned that a low temperature persisting for days or weeks was successfully used in the natural cure of some of these patients. But no one has ever tried, except in a very crude way, to learn how to favorably duplicate these original or natural methods for the cure of this disease. Heat in the treatment of malignancy probably started its progress with the development of the human race and of all the methods that have been urged to take its place it alone still retains its ancient and beneficent repute and character.

Rohdenburg[1] in a most illuminating and instructive article on one of the little discussed phases of the cancer question says on the subject of heat in its treatment: "It appears that the most efficacious of all the many conditions which can bring about regressive change (in cancer) is heat, applied from without or occurring under the limited conditions of long duration and comparatively low degree." Our difficulty with heat in the treatment of cancer has always been the one of not knowing how most effectively to get the maximum benefits from its employment.

There are two extremely practical factors which are commonly overlooked in our attempts to control cancer. One, heat, has just been mentioned. The other is our failure to recognize that the gross appearance of a malignant mass gives no clue as to what it will finally do to the individual possessing it. The more innocent many of these growths appear to be the greater their potential malignancy often is, while an overgrown, vicious, suppurating, painful mass may on treatment prove to be extremely benign. We have no assured means then of determining, either from the clinical or from the laboratory side even the approximate virulence of a mass of cancer. This makes it also quite certain that we have no method on which we can base an intelligent prognosis from the physical appearance of a given growth regardless, I repeat, of how benign or how frightful it may appear *in situ*. Many of the cases submitted to my tech-

nic have been, from our usual point of view on the prognosis of cancer, not only inoperable, but also utterly hopeless from the treatment standpoint. Yet many of these otherwise doomed cases are alive and well years after the application of the heat when it was used primarily only as a palliative. Indeed, it was at that time assumed that this was the only possible benefit that the heat application could give. Consequently we have no means of knowing, either the characteristics or the percentage of these usually fatal (if untreated) cancers, in which natural processes can, by rational management, be greatly aided to bring about an intermission, a remission or a complete postponement of the activity of the growth. We are, therefore, not justified in considering any case of accessible cancer inoperable by the heat method no matter how extensive the growth locally. The only possible exception to this is an inaccessible metastasis combined with remediless infective changes in one or more vital organs, such as the kidney or heart, and which make the outlook for the patient, if not hopeless, exceedingly grave.

Heat is a primary and fundamentally selective antagonist of the cancer cell. Radium, x-ray, d'Arsonval current and heat all have a selective action for neoplastic cells, and when they are exposed to a sufficient extent to any of these agents, are destroyed. The degree necessary for destruction of a new growth by any one of the first three, however, more nearly approaches the lethal point of healthy cells and consequently adjacent normal tissue is injured to a much greater extent than when heat alone is used. Furthermore, the penetration of heat is a rather slow process. It is disseminated by conduction rather than by radiation and is therefore absolutely controllable. This, coupled with the fact that the thermal death points of normal and malignant cells are much farther separated than is the mortality of these cells from the other three agents, makes heat the logical method of choice. Increase in temperature both local and general (acceleration of physiologic processes) is Nature's way of combating practically all pathologic invasions of poisonous substances (bacterial, proteid, etc.). Heat is involved in the reaction to disease, and it is one of the four fundamental processes of repair which have been recognized from immemorial times.[2] This fact alone is sufficient to explain the wide variation of the thermal death points between the normal and abnormal cells in their reaction to heat. I have also pointed out that this repair in the adjacent cells following the use of the heat in destroying a malignant tumor follows the normal type much more closely than is ever true after the use of radio-active substances or high frequency currents, and therefore interferes with the normal anatomy and physiology of the part or parts in the least possible degree.

In our day the treatment of cancer has assumed new interest from the use of radium, the d'Arsonval current, and the x-ray, especially with the modern deep therapy apparatus. It is not my purpose to discuss any of these methods except incidentally. I welcome them as an excellent indication of the more rapid approach of the time when the medical profession will know what is really best and most promising in the treatment of this increasing menace to the race. That all methods in addition to heat have a place in the management of a selected minority of these patients cannot be questioned. But I also know that the greater number of sufferers will receive a larger measure of benefit from the heat treatment of their operable and inoperable growths as it can be applied today than will ever be possible from any of the so far discovered radio-active agents or high frequency currents. The mystery of radium and the secret of the unknown quantity of light which has been labeled the x-ray are no more of an enigma than is heat. It is merely another of the unexplained mysteries of our existence. Indeed, in some respects we know less about it than we know of either radium, the x-ray or the high frequency current. Heat is known as a great force in physical nature, and it is harnessed and made to perform many services to mankind. Like all the great compelling powers of creation it is invisible, except through its effects and it defies analysis. It has no weight, no dimensions, no substance. It is synonymous with sunlight, and can be produced by fire, electricity, friction or chemical action. Its destructive possibilities are legion, and not the least of these is its power for good when regulated and applied to abnormal human tissues. It will probably never be better known to man than as one of the great correlated forces. Can any of us fathom what would have been saved the members of the human family, when suffering from cancer, had it been the rule to apply a piece of hot iron to every abnormal growth while it was still a small affair? The chance that heat may, in the near future, be the solution of the question of the successful treatment of all forms of cancer is not sufficiently appreciated by surgeons.

There are two methods by which heat may be applied to cancer invaded tissues. One where it is disseminated continuously for at least an hour in cavity carcinoma; the temperature ranging from 204.5° C. to 260° C. (400° F. to 500° F.); or by the employment of a hot knife in dissecting out a localized malignant mass. These are the more familiar procedures with the cautery and are the basis for whatever recognition it has received in the past in the treatment of this variable disease.

The second method for making use of heat in the treatment of cancer is an outgrowth of the work done on the malignant tumors

of animals in the experimental laboratory. With these should be noted the cases where there has been a total disappearance of malignant growths in the human subject from diverse methods of treatment. A most interesting fact from a study of these cures is that it will be found that the method used initiated some form of irritation in the growth which seemed to cause it to slowly melt and waste away. One of these is mentioned by Rohdenburg. A woman suffering from a typical spindle-celled sarcoma of the pelvis was treated for rheumatic-like pains attributed to the growth by exposing the entire body in a continuous light bath (baking), with the hope of relieving her pain. Thirty treatments in all were given. To the surprise of everyone, instead of growing progressively worse, as she had been doing, the patient slowly improved until her health was completely restored two years after the operation. The pelvic mass also disappeared. This is not an isolated instance. To those who are especially interested I would recommend the articles by Gaylord and Clowes[3] and also that by Lomer[4] (quoted by Rohdenburg). This last investigator has collected a series of 213 cases of recession of malignant growths, occurring chiefly after the application of the cautery. These articles are intensely interesting and well worth study. But I do not want at this time to relate cases except as they may be necessary to make more clear the principle that I am trying to reveal. This is that cancer abhors heat. But we have not sufficiently appraised the immense possibilities in this great fact, at least to the extent where we have attempted to apply it practically in the treatment of the disease. I want to emphasize that I am not now discussing the comparatively brief application of high heat as applied by the cautery, but the continuous use (days and weeks) of a low temperature artificially produced in a mass of accessible carcinoma either in one of the cavities of the body or on its surface; thus applying, at will, to external malignant growths and to accessible cavity carcinoma the same methods which a continuous fever sometimes produces unbidden in the subject of cancer. The difference between this second method where the heat is applied externally and the spontaneous cures of malignancy by natural methods is that in the latter the temperature of the blood is raised by the acquired infection and this heated blood destroys the abnormal cells.

In the second method, which we are discussing, the heat is diffused from a diminutive metal thermogenic tube and acts directly on the enfeebled cells. This heating unit is the outgrowth of a cruder instrument[5] which I had made in 1916 after learning of the experiences of Wassermann and Delbet following the subjection of laboratory animals to a continuous external low temperature—40.56° C.

(105° F.), with the result that not only did their cancerous growths not develop but they gradually receded and disappeared.

My first instrument was the outgrowth of many attempts to find a satisfactory method for applying a low temperature practically continuously in cavity carcinoma without the intervention of an anesthetic local or general (Fig. 1). With this instrument I have seen, in a few cases, a vaginal tube which was packed with cancer freed of the disease in a few weeks. I mean by this that there was no further ocular or digital evidence that a malignant mass was or ever had been in that particular anatomical location. The first temperature of the heating iron was set at 48.89° C. (120° F.). With the

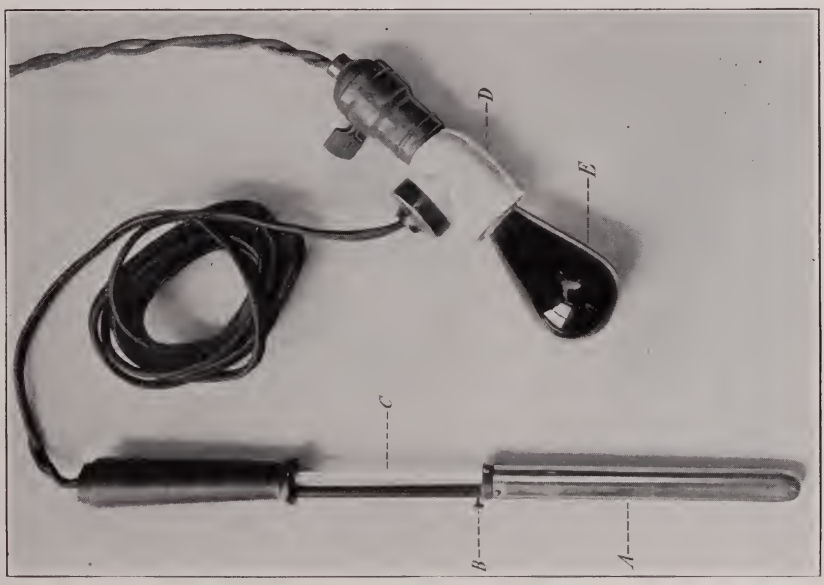

Fig. 1.—Showing a current-tap (*D*) which can be inserted in any electric lamp socket of 110 volts, on either a direct or alternating current. A carbon lamp (*E*) of half ampere with a deep blue glass globe is part of the outfit. The intense color of the globe protects the patient from the disturbance that would otherwise come from its flashing on at night, as it would when the current automatically turns away from the heating iron into the electric bulb. The degree of heat is regulated by a small set screw (*B*). The temperature while the instrument is in use is shown by the thermometer (*C*). The heat is maintained automatically in the heating iron (*A*) at the required temperature, through the series current-tap.

patient in bed this degree of heat was maintained for eighteen hours. Five degrees was added at each additional eighteen hour period until the thermometer registered 71.11° C. (160° F.). This last was continued for several weeks—in one case for six weeks. Further experience I believe will show that a temperature of 60° C. (140° F.) applied for a shorter time will accomplish all that the higher temperature and the longer period will; the explanation being that the heat in a cavity will accumulate when confined and will steadily rise even though the heating tube starts with an initial temperature

of but 60° C. (140° F.). Another important factor is the one that normal, living human tissues rapidly acquire a remarkable immunity to increasing therapeutic degrees of heat. This appears never to be true of the low grade cell. Indeed, Loeb has shown that even partial injury to a malignant cell by heat is transmitted through several subsequent cell generations.

This first instrument (Fig. 1), however, proved to be impracticable in that its mechanism was too easily put out of commission especially in hospital work. It was also larger than was necessary and consequently heavy and unwieldy. But in the few cases in which it was employed it demonstrated remarkable destructive effects on the cancer cell in the invaded tissues with a minimal degree of injury to the normal structures. I then contrived the instrument which is shown in Fig. 2. Aside from the heat controller which can be plugged

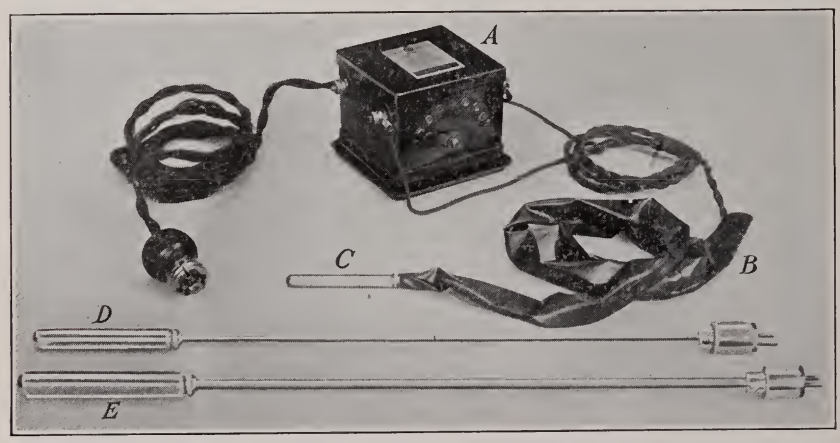

Fig. 2.—*A*, Transformer or heat controller; *B*, cigarette drain to protect lead cords from secretions; *C*, small thermogenic tube; *D* and *E*, medium and large thermogenic tube.

into any lighting system of 110 volts alternating current the thermogenic tube (C) is the essential part of the device. It consists of a small metal sealed tube containing a heating element activated by electricity. This latter agent in no way comes in contact with or acts upon the tissues. The effective curative agent in the tube is merely and alone simple heat.

This tube, in the treatment of cancer, can be introduced into a cavity containing the disease or into a malignant mass in the same way as radium is now employed. The tube of heat, however, will have the advantage of avoiding the present destructive effects on normal structures peculiar to or characteristic of the uncontrolled penetration of radium and of the x-ray. In carcinoma either in mass or in a cavity this heater can be so regulated as to supply a degree of low heat sufficient only to penetrate the involved tissues the neces-

sary distance. As will readily be understood this at once removes an objection to the cautery where the high heat of that instrument was, to many surgeons, a barrier to its most effective use. It will also tend to turn the minds of physicians in general away from the unfortunate and erroneous idea that the cautery is in some way the essential element in the success of this method in curing cancer. The mere use of the word cautery has caused many surgeons to overlook the fact that the effects produced in cancer are derived from and are dependent upon the thoroughness of the diffusion of the element heat from the heating iron uninfluenced by an extraneous agent. I trust, however, that I shall not be misunderstood. This therapeutic thermic applicator is not offered with the idea that it will supersede the use of the knife cautery. It can never entirely do that. In patients suffering from an external malignant growth, especially if it is suppurating, the hot knife will still be found to be the most satisfactory method yet offered for its safe removal.

The purpose of this paper then is to make a preliminary report on the value of the prolonged use of a low degree of heat in the treatment of cancer in the class of cases in which it can be made applicable. One of these is the vagina, cervix, utero-cervical junction and body of the uterus. In the majority of instances where this simple apparatus is used the heat is easily regulated and controlled so as to be destructive only in a minimum degree to normal tissues acting in the greatest measure as a destroyer of the cells of cancer in any portion of the birth tract. An additional benefit is the one of practical freedom from danger and as well simplicity and comparative cheapness of the required apparatus.

There is only one caution that I want to emphasize in the use of this heater. Don't shove it into a mass of cancer. Force or roughness or any kind of movement or manipulation has no place in the treatment of this disease. If it cannot be deposited in a mass or cancer filled cavity without the slightest traumatism, the cautery knife should be used to make a pocket into which it can be easily introduced.

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DISCUSSION

DR. AARON B. MILLER, Syracuse, New York.—Several years ago, I attended one of the western meetings, when Dr. Percy demonstrated his method of operating with the cautery. I was much impressed with his enthusiasm,

but I left the meeting and came home with the feeling that I did not care to be treated in that way, nor so to treat my friends. One of our Rochester associates was so enthusiastic that he brought home the apparatus, and I said to him, "According to the theory which Dr. Percy has presented and the demonstration which we have witnessed, I shall send to you all the bad cases of cancer, because I do not want to have the people in Central New York following me around, with discharges of the rectum and bladder coming through the vagina. Dr. Percy has made an impression with what he has shown us today, for I believe it has much merit, and that his improved mechanical device is a marked advance in our armamentarium in treating malignancy of the womb."

"One swallow does not make a summer," but there was an instance where I was thoroughly impressed, and am at the present time, that heat *did* bring about the recovery of a case of cancer. Near our city, a woman with advanced cancer of the cervix was cared for by an able surgeon, and feeling it was an inoperable case, the only thing that could be done would be to afford her relief. He burned out the tissue of the cervix and into the fundus with the actual cautery.

Several months after this, I was asked to see the patient at her home. My opinion was that she could not live long (and I had all confidence in the diagnostic and surgical ability of her physician) which opinion was confirmed by my examination. I found her pelvis filled with an exudate, and concluded this was an extension of the malignancy. It conformed to the condition we recognized forty years ago as pelvic cellulitis, a good enough name at that time, as we did not know better. So I told her people there was no question but that the prognosis was very bad. She was not sufficiently ill to be confined to her bed and kept there, and it was thought better to get her out in the air, bring her to the city and have her treated by a radium specialist.

Accordingly, she was brought to the city and received radium.

I did not hear anything from her for a long time, but two years ago, on returning from the meeting of this Association, I found her at my office with the physician who had called me to see her in consultation. I was a little amazed. I wondered how she could have been brought back from the grave.

Physical examination revealed the pelvis absolutely free from any disease, only the absence of the cervix, the exudate had passed away, and she seemed to be in a normal condition.

The radiologist takes the credit of having cured her. There is no question in my mind but what it was the cautery action which brought about this cure.

DR. G. VAN AMBER BROWN, Detroit, Michigan.—Five years ago next December I first began to follow Dr. Percy in his treatment of carcinoma of the cervix by heat. Since then I have operated upon 14 patients, combining with the use of heat, ligation of the internal iliacs and ovarians, in some cases dissecting out the postperitoneal lymphatic glands. Of those 14 cases, two died immediately following operation. One of these was moribund when she went to the operating room. In another, cancer was complicated with fibroids and pyosalpinx. She died from a peritonitis eight days after operation. Of the other 12 cases, there are four that have shown a recurrence; two died early; the third one I operated on five years ago next January and she died the first day of June this year, but whether of carcinomatosis or not, I have not learned. The fourth is still living with a recurrence of very slow growth. So that of the 14 cases eight are today, symptomatically at least, perfectly well.

You may remember the case of a young woman, 27 years of age, which I reported last year, an advanced case in which we used heat with ligation. She refused to have anything further done. That woman menstruates three days in

the month, and only two days before I came here her husband reported that she was enjoying the best of health. I have not examined her for ninety days.

In connection with this work, I desire to call your attention to the behavior of cancer cells which are within the walls of the three coated blood vessels. These cells are less vulnerable to the effects of heat than those not so situated. It occurred to me that the reason for this is—that just as the water circulating in the water jacket of an automobile has a cooling effect on adjoining structures, so the blood circulating in these larger blood vessels has a cooling effect on their walls, thus preventing, when heat therapy is employed, the destructive effect on the cancer cells growing within these walls. So if in the treatment of carcinoma of the cervix the use of the starvation ligature is resorted to, thus checking the blood stream, these cells within the walls of the larger blood vessels will be rendered as vulnerable to heat as are cancer cells outside blood vessel walls.

I would like to ask Dr. Percy a question. He spoke of applying the cautery to masses of macerated tissue by forcing the instrument into the mass. If we so employ the cautery, is not a carbon core produced, and if so, it would prevent the dissemination of heat, also act as a plug, thus checking drainage; and if the carbon core is not produced how do you prevent it—or how should the condition be met if the core is produced?

DR. GORDON K. DICKINSON, Jersey City, N. J.—If we do not happen to have the Percy material and instruments, we can use the method of the late Dr. Byrne, of Brooklyn. For a number of years I have been employing that.

There is one case I want to speak of, a woman with an epitheliomatous cervix of some size. In ten days the uterus was removed, and cancer cells could not be found.

DR. JAMES E. DAVIS, Detroit, Mich.—The remarks of Dr. Percy recall the classical experiment of the two frogs, when the foot of one frog was placed in the stomach of another frog. So long as the foot in the stomach of the other frog was alive, that foot was not digested, but digestion commenced immediately when the leg was amputated. The same technical biological law holds as far as this subject is concerned.

In regard to the behavior of tissues after treatment by heat, I have been very much interested in studying some of the sections given to me for diagnosis. I have had the tissues before any work was done, also after one treatment with heat, and then again after several treatments. It is exceedingly interesting to note the changes that take place in these tissues. A living tissue cell must have a circulatory system. In the higher types of life, we have a circulation that is to a large extent within thin walls. Some of the walls have doubly coated vessels, and some are single coated vessels. We have tissue spaces in which there is lymph fluid or tissue fluid; the subjection of the tissue to a temperature that is above what may be called its ultra toleration will bring about interesting intracellular rearrangement. The cell undergoes demobilization, the outline of the cell as perceived under normal conditions is lost; it becomes blurred. Just whether that cell can mobilize or not, is a question. We do know, when we get a mass of cells all demobilized, and there are no intracellular spaces, then it is impossible to have mobilization of tissues. In other words, the tissues are to be considered devitalized. After dealing with the cells we necessarily look to the condition of the tissues, the arrangement of the cells one to another, the different types of cells, etc.

In cancer one of the most important changes that we have to bear in mind is that which we see, for instance, in epithelial tissue in the germinative layer of cells. When this is disturbed, and the growth is below this layer, we have one of the reliable proofs of malignancy. In the application of heat we find the germina-

tive layer is particularly affected; in other words, the normal behavior of this tissue is directly interfered with.

I think Dr. Brown has an excellent idea of going one step farther and depriving these tissues of the blood supply where that is possible. I have examined a number of sections from tissue he has sent to me, and it does seem that by this combined method you do get a very rapid and pronounced result. It practically duplicates the condition that you see in tissues where the natural resistance is being built up against malignancy. There is embolism of the blood vessels, increase of the connective tissue and later on there is scar tissue formation with segregation of the area that is involved in the malignancy. When the blood vessels are tied off and the tissues subjected to heat, it does seem as if you had brought about the conditions that are ideal for arresting the cancer mass. The result is determined by the accessibility of the heat, or the ability to cut off the circulation beyond the area so as to completely isolate it. Accessibility of the cancer tissue seems to be the real difficulty to overcome.

DR. FREDERICK S. WETHERELL, Syracuse, N. Y.—Dr. Percy has presented no statistics of any kind, this being strictly a preliminary report. We see cases of inoperable or so-called inoperable carcinoma of the cervix, and repeatedly they die, notwithstanding radium or x-rays. This paper will be widely read, and we would like to have an answer for the men who are discussing this paper *pro* and *con*, what Dr. Percy's experience is in these inoperable cases of carcinoma which go on in spite of the fact that they have had radium and x-ray treatment and ultimately die.

DR. RUFUS B. HALL, Cincinnati, O.—I would like to ask Dr. Percy whether if a woman during her first labor had an epithelioma in the cervix, as large as a big orange, filling the whole vagina, he would destroy that by the curette or cautery knife before he would use continuous heat.

DR. PERCY, (closing).—I am quite sure that you will hear a great deal more about this low heat method of treating accessible cancer in the near future, for the reason that it has much in it of permanent value in this disease. All it requires is that surgeons learn the methods and indications for its use. The heat treatment, as it has been developed in recent years, follows the lines of recognized surgical procedures. In addition, one is not working in the dark with an uncontrollable agent, but rather with one with which we can always determine the correct limits of its application. It is also infinitely less dangerous to normal structures and to the general well being of the patient than is true today of radium or the more recent deep therapy x-ray apparatus.

In answer to Dr. Brown's question as to the procedure best suited to the destruction of the cancer cells that have already invaded the walls of the blood vessels. It is a most interesting fact that the vessel walls, and also nerve structures tolerate at least a third more heat without permanent injury than other tissues of the body. You can apply the heat to the blood vessels, especially the arteries, sufficient to brown them, and even leave scorched areas such as appear on your toast in the morning from contact with the hot wires of your electric toaster. I have done this many times and I have never seen any immediate or subsequent harm come to the vessels so treated, and the cancer cells in their walls are certain to be destroyed. In some of my early papers I explained this resistance as due to the uniform temperature of the blood which they contained protecting their walls from overheating. I thought this observation original with me, but I found later that Doyen of Paris had made and published the same observation. I have been through a lot of grief in order to obtain the facts as I now know them regarding the action of heat on human tissues, but someone had to get this information cor-

rectly. The surgeons who take up this work from now on will have a much easier time. I have taken a mass of cancer that surrounded the whole extent of the axillary vessels and fully two inches in diameter and cleaned that mass from the vessel walls so that no vestige of the disease remained. If the malignant cells have involved some portion of the depth of the walls these will entirely heal over in the general repair that follows the application of the cautery heat. It is well to start the dissection of the pathological structures by beginning in the normal tissues just adjacent to it. This will give one the correct anatomical landmarks that can be followed into the growth with the hot knife. The flat blade of the knife cautery can often be shoved along the blood vessel if it is done quickly, and then brought rather suddenly out through the overlying exuberant mass. This will split the accumulation of cells that surround the vessel, and if you are not too awfully slow in this maneuver you cannot possibly do any injury to the vessel walls. When the mass is split it is a comparatively simple procedure to push the remainder of it entirely away from the rest of the structures to which it may be adherent, with the nose of the cautery knife. It is most impressive how resistant these blood vessels are for a very short time to the application of a cautery knife that frequently has a temperature of from 600° F.—800° F. The stumps of the small arterial branches that are necessarily severed in this way are tied with No. 1 plain catgut. The fundamental thing is that cancer cannot be successfully transplanted after it has been heated for ten minutes to 113° F., (45°C.) Cancer really seems to abhor heat.

As to my statistics:

I am frequently asked about these. Frankly, I have never been greatly interested in my results merely as results. My chief concern has been to know whether I could destroy an otherwise inoperable mass of cancer so that the patient would live free from the further plague of her disease. So far I have been able to do this in 17 per cent of my uterine cancer cases. Please remember that these were of the utterly inoperable type. They belonged to the class that we have heretofore absolutely refused to do more than try to palliate with morphine. Even if you clean up these malignant growths with the cautery the patient frequently dies because of a coincident myocarditis, or if not this, a surgical kidney which has resulted from the previous sepsis incident to the breaking down of the tumor.

When we are considering statistics in operations for cancer situated at the uterocervical junction we should not forget those of John Byrne. He reported over 60 per cent of his cases alive and well beyond the 5 year period, and no one has ever called in question the correctness of his statistics. Byrne for years thought it was the electricity in his cautery blade that was responsible for his good results, but I found in the last article that he published where he used the word heat for the first time. Dr. Byrne never opened the abdomen to learn the direction of the uterus in the pelvis, but determined this by the introduction of a sound into the cervical canal and up into the body of the uterus. Then with his long handled cautery knife he coned out the entire cervix through the uterocervical junction. His excision often extended through the uterocervical junction into the body of the uterus. When he had completed his operation the vault of the vagina looked not unlike the dome of a cathedral. It was after such an excision that he applied his mushroom shaped cautery tip until he had thoroughly dried out the remaining tissues. I believe that this initial work of John Byrne will finally prove to have been of transcendent importance in the final solution of the treatment of cancer by heat.

I do not want to be understood as decrying the use of either radium, the x-ray or the d'Arsonval current (Diathermy). They still have a place in the treatment of a selected number of these cases. I have had a great deal of personal ex-

perience with the last two, and have seen the practical results from the use of radium under the direction of those who were qualified to use it. It is not necessary to detail my experiences with any of these methods or agents except to say that they require expert knowledge of the highest type especially along the lines of the natural sciences. This is something that the majority of those who are now trying to make use of them do not possess, and it will remain a handicap to their most successful use for many years to come. The ease with which all of these agents set up and leave a chronic endarteritis after their application is most discouraging to their more efficient use. The case cited by Dr. Miller is interesting. But that same thing happens time and again.

Ewing of New York said to me a few years ago, that the balance in cancer is easily upset, and it is. But the devilish side to it is the ease with which it is disseminated. Doyen likens it to a shower of pollen distributed by the wind. I always think of cancer reinfection as being as subtle and as mysterious in its possibility for reappearing, after we have tried to destroy it by the usual methods, as is the arrival and spread of the bacillus pyocyaneus in our surgical wards. Cancer sometimes comes almost like an apparition, apparently from nowhere, except where we use the heat and then it does not return in that particular region. Heat effectively heads it off.

There are a lot of patients who are alive and well over the country who have been operated on as Dr. Brown reports. No one so far has brought the number of them to the attention of surgeons. Dr. Rea Smith of Los Angeles had six patients with utterly inoperable uterine carcinoma yet they are perfectly well over the five year period. This, I may say, is not an isolated instance. These were his first cases following my technic, and this report, I report, can be duplicated in many other places not only in this country but abroad.

We are prone to manipulate a mass of cancer too much, too often and too roughly. Some of us are almost as bad in this regard as are the so-called "rub doctors." I am convinced that we loosen fragments of the tumor and set them free in the circulation to take on new virulence in a new location by our thoughtless and indelicate handling of these tumors. Cancer should be treated as far as touching it is concerned, as if it were a most valuable piece of Dresden china.

Regarding the question of Dr. Hall as to the treatment of the large masses of cancer in the cervix, and whether I would clean them up first with the cautery before applying the continuous low heat as I have outlined it in my paper. If giving a general anesthetic, in order to destroy the mass with the cautery does not interfere too much with the natural resistance of the patient to cancer, then undoubtedly its destruction would leave less for the continuous low heat method to do. To destroy as much of the gross mass as is possible at one sitting and then to apply the continuous low heat is, in the largest number of cases, the wisest course to pursue.

I have seen a vagina that was packed full of cancer clear up in a few weeks from the application of the continuous low heat so that there was absolutely no clinical evidence of the disease remaining.

I have received considerable criticism because occasionally my technic is responsible for a vesicovaginal fistula. But if there is cancer near or into the bladder it should be destroyed, fistula or no fistula. What is the use of operating if we are to leave a bladder infected with cancer untreated? It is well to open the bladder suprapubically and apply the heat direct. In this way one can do much more efficient work through the direct application of the heat.

The results in bladder cancer are most gratifying. My first case is alive and well after eleven years. A most important point when the cautery is used to apply the heat is to hold the instrument still or quietly in one place until all of the

tissues are fixed by either the cancer, or by an inflammatory exudate are rendered normally movable again. Unless you do that you have not gotten penetration sufficient to destroy your malignant infection. You cannot wobble your heating iron all around as some surgeons do when attempting to get the maximum benefits from the heat treatment. Heat penetration cannot be most effectively secured in that way. It takes time to apply the heat effectively, but it makes the difference between success and failure.

DR. YATES.—How often and how long do you apply the heat to these fixed tissues?

DR. PERCY.—If you make your tissues freely movable from the heat at the first sitting that is usually all that is necessary in the way of treatment. The time required to get this result in the average case is usually about an hour, sometimes less and sometimes over. The time that the patient is on the table does not seem to matter if they are given the minimum quanity of ether which is usually all that is ever required.

OBSERVATIONS WITH COMMENTS ON A STUDY OF THE URINARY TRACT OF EIGHTY FETUSES AND YOUNG INFANTS

By G. VanAmber Brown, M.D., and Catherine Corbeille,
Detroit, Mich.

OWING to the scarcity of records on the pathology of the upper urinary tract in early life, the following observations were made during the summer of 1922. While this report is to be considered as merely preliminary, owing to limited time and material, a number of important points will be worth noting, which with others are capable of elaboration by further study. As an aid to the work suggestions are solicited.

The material at hand may be divided into three groups. The first is made up of twenty fetuses obtained during the summer, all being recent abortions. They range from two and a half months to term. The second group includes twenty cases of young infants and prematures on which autopsy records are available, and in addition, a few scattered cases in which only the specimens were obtainable. The third is a group of forty dissections made in the Department of Pathology at the Detroit College of Medicine and Surgery. The majority of these latter cases presented some type of monstrosity or maldevelopment.

The point to be noted in connection with the nature of the material under observation is that in no case was it selective, except in those few instances in which only the actual specimen was available. A random selection was made, the percentage of kidney pathology, whether primary or secondary, being for this reason the more significant.

THE KIDNEY IN THE FETUS AS A SEAT OF CHRONIC INFLAMMATORY CHANGES

Out of the forty microscopic examinations made, seven cases showed well defined characteristics of chronic inflammation. In two of these cases, the change was of known syphilitic etiology, and in four others the evidence was also that of syphilis, though the laboratory findings were negative. It is of interest to note the early age at which these evidences of chronicity become apparent. A case of induced abortion of a two and a half month's pregnancy gave a picture of definite fibrosis of the nephrogenic tissue with proliferative increase of the embryonal connective tissue. Another fetal kidney, of four months' development, was diffusely infiltrated with small round cells, with in-

creased connective tissue elements—a picture of proliferative interstitial nephritis. Another, a five months' kidney, presented, in addition to the above pathology, proliferative blood vessel changes—the characteristic endarteritis of adult syphilitic lesions. It has been observed that this blood vessel involvement is not a constant accompaniment of luetic changes in early life. It may be entirely absent, while the existent changes are strikingly specific. A case of an infant, ten days old at death, clearly corroborates this observation. The kidney showed diffuse interstitial fibrosis in both medulla and cortex, with hyaline degeneration of the tubular epithelium, and no vascular change whatever.

Observations of syphilitic changes in fetal kidneys are noted by J. W. Ballantyne in his "Antenatal Pathology and Hygiene." He has found in addition to the facts noted, enlargement of the vessels of the medulla, but he does not record the possibility of the total absence of vascular pathology. Ballantyne has also reported two cases in which there was strong evidence of chronic idiopathic fetal nephritis. One baby died a few hours after birth, the other at twenty-one days. There exists, then, the possibility that the pathology of the fetal kidneys reported above was idiopathic, at least in those cases where syphilis was not the cause. No proof exists, however, that such is the case.

HEMORRHAGIC CONDITIONS INVOLVING THE YOUNG KIDNEY

Although hemorrhagic diseases are known to be of frequent occurrence in the newborn, no reference has been found to diffuse hemorrhages in young fetuses. Of the six cases observed, three were fetuses, two and a half months, three and a half months and six months old. The first of these was a pregnancy aborted by drugs. The fetus showed multiple subcutaneous hemorrhages all over the body. The abdominal cavity was filled with a sanguineous fluid, and the viscera showed multiple small hemorrhages. Microscopic examination revealed marked subcapsular hemorrhages of the kidney, though the parenchyma was uninvolved. The three and a half months' fetus did not show any external evidence of hemorrhage. The kidneys, however, looked hemorrhagic when opened, and the microscopic picture was one of small cortical hemorrhages.

The cause for hemorrhage in the kidney of the six months' fetus was probably mechanical, occurring in a case of imperforate urethra with hypertrophic dilatation of the bladder and extreme general edema. Reference will again be made to this case.

A case of primary hemorrhagic nephritis was noted in a young infant and was considered the primary factor in causing death. There was no gross pathology other than malnutrition.

A very spectacular case of hemorrhagic diathesis and thymic apoplexy was seen in a baby of three days. (Fig. 1.) A large dark red mass was found in the abdomen, extending from the diaphragm to below the umbilicus, to which the intestines were adherent, and by which they were displaced. The mass was found to be a retroperitoneal blood clot, and when sectioned, revealed the kidney imbedded in the center. The thymus was greatly enlarged and ruptured by the excessive

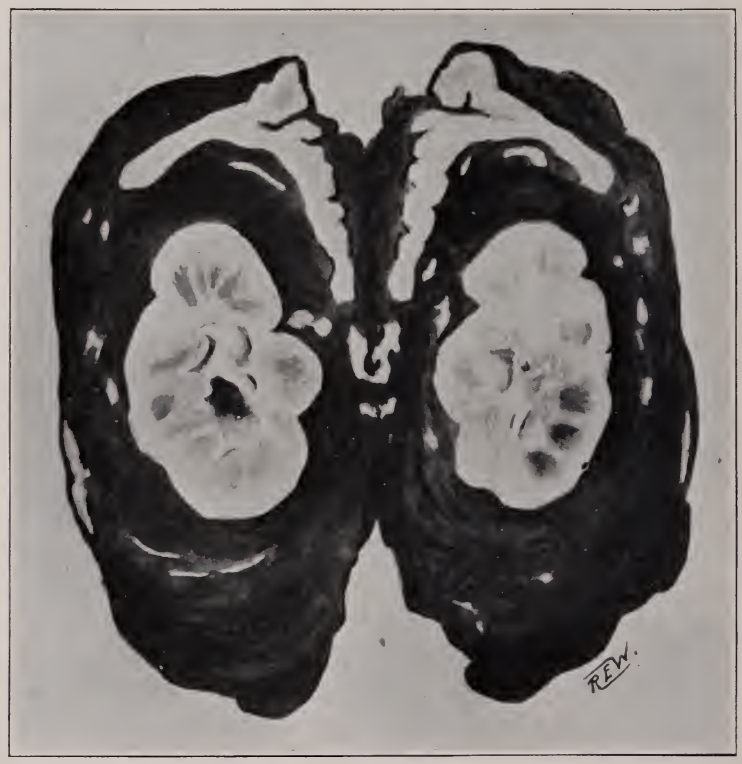


Fig. 1.—Kidney embedded in blood clot from case of hemorrhagic diathesis and thymic apoplexy.

hemorrhage. Microscopic examination of the kidney showed no minute pathology.

SECONDARY CHANGES IN THE KIDNEY IN INFECTIOUS DISEASES

In every case of death caused by an infectious process, the effect on the renal parenchyma was marked. The changes noted represent (1) actual metastasis of infection involving the cortex of the kidney, (2) interstitial changes of a chemical nature and (3) degenerative processes. The type of kidney pathology depends, evidently on the type of infection and the duration of the condition. A case of comparatively long-standing infection terminating in suppurative otitis media

and lobar pneumonia presented evidence of metastasis of the infection to the kidney, as shown by the definite cortical foci of infection. The tubular elements were distended with fluids and in a condition of early degeneration. Two kidneys, one from a case of chronic pneumonitis and acute terminal purulent bronchopneumonia, one from a case of prematurity and malnutrition with an unknown focus of infection, presented a similar type of change, namely hyaline degeneration of the renal epithelium. The cortex in each case was a mass of degenerating elements. matted together in a way to minimize the possibility of functionating. There was intense congestion of the blood vessels and of the capillaries of the medulla in the kidney of the premature.

A picture of interstitial nephritis with obliterative parenchymatous degeneration was seen in the kidney of a four months' baby which died of acute encephalitis. All the functionating elements were shrunken and evidently nonfunctionating while the interstitial elements showed proliferation and edema.

A secondary inflammatory condition, not of an infectious nature may be mentioned in this connection. At autopsy of a six day infant, an imperforation of the common bile duct at the junction of the cystic and hepatic ducts was discovered, death having been caused by toxic bile retention. Inflammatory changes of purely chemical nature occurred in the kidney. There was albuminous degeneration of the tubules, sclerosis of some of the glomeruli and intense capillary congestion in the medulla, with retention of bile pigment in the straight tubules.

MALIGNANT TUMOR OF THE KIDNEY IN AN INFANT

Malignant tumors of sarcomatous nature are seen in early life. L. Porter and W. E. Carter report the existence of such tumors in kidneys of six months' fetuses, and refer to a case in which labor was obstructed by the presence of a large round-cell sarcoma having its origin in the renal tissue. (Figs. 2 and 3.)

In the present group, one case of renal malignancy occurred in an infant of seven months. An exploratory operation was made, but the growth had become too extensive to permit of any surgical treatment. The history of the tumor was that of rapid growth with very marked enlargement during the last days before the operation. Some of the tissue was removed following which severe hemorrhage and death occurred in a few hours. The kidney capsule was distended by the growth which appeared almost entirely intrarenal, excepting that the capsule and adjoining mesenteric lymph glands appeared involved in the tumor. The tumor was solid, opaque and

apparently divided into lobules. Considerable hemorrhage was evident within the tumor, and there was some hemorrhage without. The liver was pale and yellow suggesting depletion from hemorrhage.

RENAL CALCULI WITH CEREBRAL CALCIFICATION IN A CHILD ONE YEAR AND SEVEN MONTHS OLD

The patient was rachitic, having had a number of illnesses after the eighth month of life. First he had diphtheria for three weeks

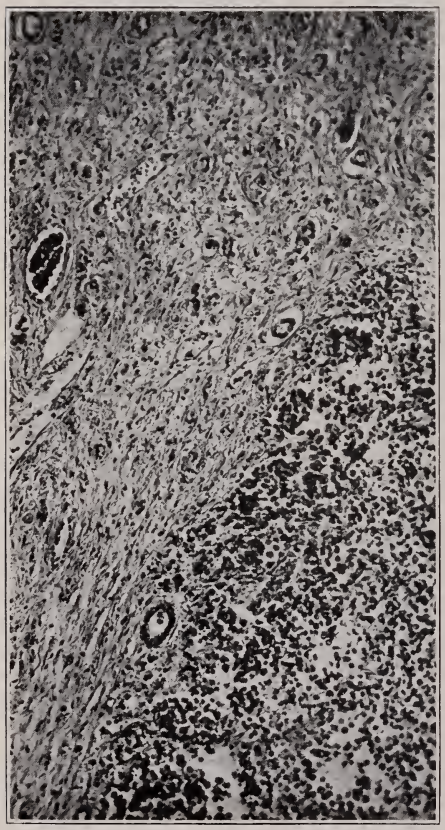


Fig. 2.—Lymphoblastoma of kidney in 7 months infant.

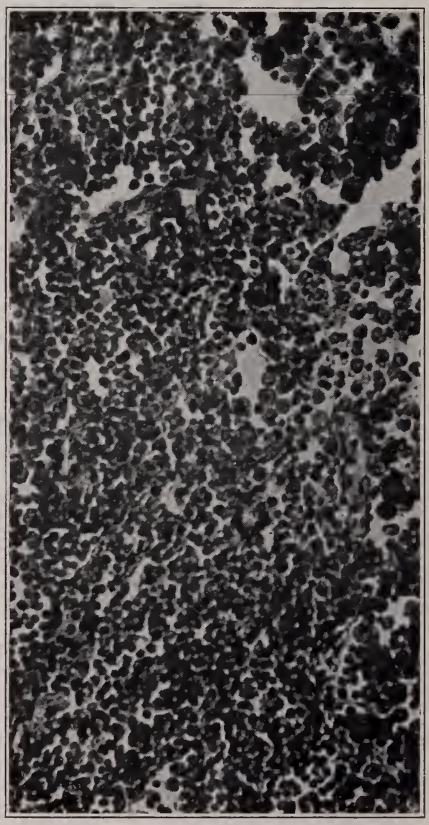


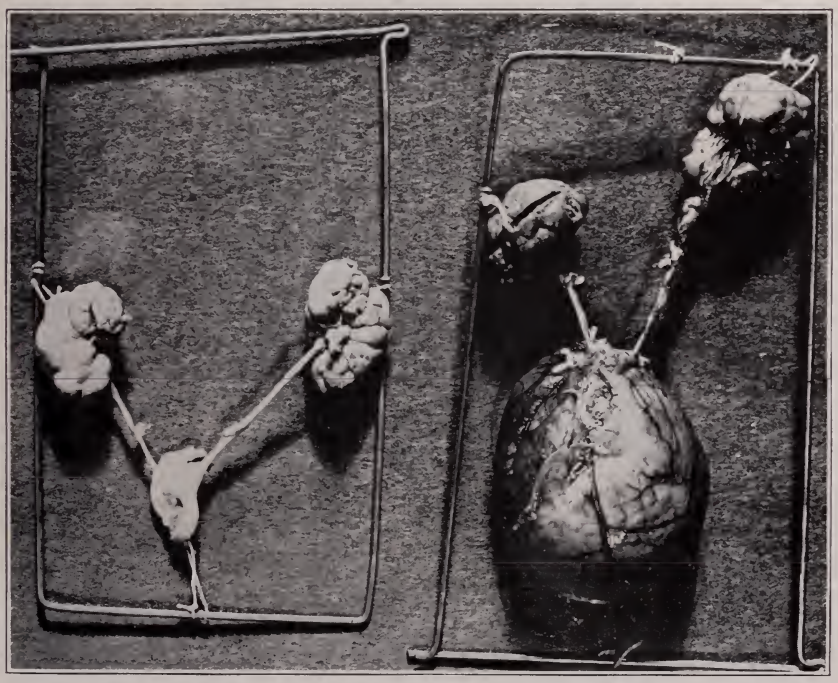
Fig. 3.—Higher magnification of neoplasm shown in Fig. 2.

from which he made an uneventful recovery. When a year and one month old he started to have a temperature varying between 100° and 106.2°. This lasted for fourteen weeks. At the same time the right arm became paralyzed. Diagnosis was not made at the time, though it was positively stated that it was not infantile paralysis. Five months later the patient had a mild attack of chicken-pox, and recovered without complications. A week before death he again developed the characteristic temperature varying between 100° and

106°, was prostrated and continually rolled his head from side to side.

At autopsy, the lungs were found to be consolidated, the brain congested. The right kidney exhibited a dilated pelvis with two

A.



B. *C.*

Fig. 4.—*A.* Premature twins delivered at 6 months by cesarean section.
B. Normal kidneys, ureters and bladder from normal fetus.
C. Greatly distended bladder, hydroureters and slight hydronephrosis from edematous fetus.

small concretions 3 mm. in diameter one in each of two calyces. Microscopically the kidney showed no pathology other than congestion, but the brain showed rather extensive areas of calcification, these

being surrounded by small round cells of the lymphocytic type. The spleen showed early amyloid degeneration.

Varying opinions exist concerning the frequency of urinary stone formation in infancy. F. Hinman quotes two figures in his report of a case of multiple ureteral stones in an infant. Rafin, in an analysis of thirty-nine cases of renal and ureteral stones recognized at operation and autopsy, finds none of the patients under one year of age, and only five between the ages of one and five years. But Rayer writes that renal calculi have been observed at all ages, including the fetus and infant. He cites ten cases, two fetuses of six and eight months, three newborn infants of one, two and eight days and five of three, four, six and eight months.

EXTREME GENERAL EDEMA ASSOCIATED WITH IMPERFORATION OF THE URETHRA

This occurred in one of premature twins, delivered at six months by cesarean section. The mother's blood showed a positive Was-

Fig. 5.—Horseshoe kidney.

sermann reaction. She had one child a year and a half old which was living and apparently healthy. Two days before the operation her abdomen began to ascend very rapidly, until the enlargement reached the sternum. On opening the uterus extreme hydramnios was encountered. The two fetuses were removed within a few minutes of one another. (Fig. 4.) Their appearance was strikingly contrasted. One, breathing at delivery, was small, wrinkled and poorly developed. The other, dead at delivery, was enormously enlarged by a severe, general edematous condition. Arms and legs were like bags of water, and the abdomen was greatly distended. On opening the abdominal cavity, free peritoneal fluid was encountered and the bladder was found to extend to above the umbilicus. It was greatly dilated, containing two and a half ounces of fluid; and its blood vessels were congested. The ureter was enlarged, and sacculated especially near

the kidney. The kidneys showed mild hydronephrosis, and were swollen and boggy. After dissecting out the bladder it was found that none of the fluid could be forced out through the urethra—an imperforation was discovered very near the bladder. Chemical analysis of the fluid contained within the bladder revealed the presence of urea in addition to large amounts of protein. It partook beyond a doubt of the nature of urine, and may throw some light on the much discussed question regarding the functioning of kidneys in prenatal life. The general edema may, at least partially, if not entirely, be laid to the mechanical obstruction caused by the imperforate urethra, though the enormous degree to which it had risen may

Fig. 6.—Fused kidney with double hydroureter.

have been due to some condition not accounted for. The microscopic examination showed only extreme dilatation of the blood vessels with some hemorrhage, with no characteristic luetic change. Examination of the placenta showed only mild edema.

MALFORMATIONS

Of the eighty fetuses and infants studied thirty-seven presented some form of outward malformation. Nineteen showed craniorachischisis; three, hydrocephalus; four, exencephalon; two, meningocele; two, deformities caused by amniotic adhesions; two, congenital hernia, and one each of the following: synophthalmus and arhinencephalon,

cephalothoracopagus, talipes, meningo-encephalocele occipitalis and one pair of united twins.

Malformations of the upper urinary tract existed to the extent of twenty per cent of the total number studied involving the kidney, and 11.25 per cent involving the ureters. Six cases showed hydronephrosis, four bilateral and two unilateral. Two with congenital cystic kidneys were found, one bilateral, one unilateral. Two cases showed deficiency or absence of lobulation, two pressure deformities, and two malposition, and in two, fusion, one of which was associated with hydroureters. (Figs. 5 and 6.) Of the ureteral malformations, there

Fig. 7.—Hydroureters with bilateral congenital polycystic kidney.

were five cases of hydroureter (Fig. 7), two bilateral, three unilateral; two cases of double ureters, one unilateral and one bilateral (Fig. 8); two kinked ureters, and one of bilateral tortuous ureter. The latter was the result of malposition of both kidneys and bladder, the ureters, spirally twisted in their entire length, being enclosed in a connective tissue sheath not involved in the torsion.

The occurrence of definite kidney and ureteral deformity accompanied each of the three cases of hydrocephalus studied. One showed bilateral hydronephrosis and one unilateral hydroureter and hydronephrosis (Fig. 9). The third showed a left ureter 9 cm. long, dilated in its entire length to more than a centimeter in diameter, while on the other side the ureter was 2 cm. long, the kidney being immediately

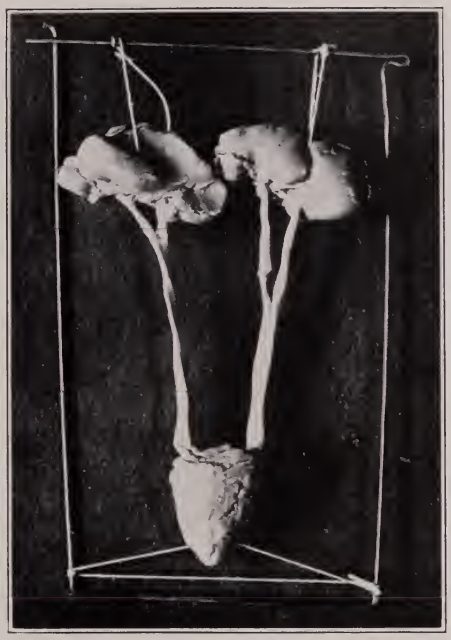


Fig. 8.—Bilateral double ureter.

Fig. 9.—Congenital non ascent of right kidney with short ureter and dilatation of left ureter.

adjacent and posterior to the urinary bladder, which was enlarged and had thick walls.

There is apparently some close relation between kidney and brain

development. Does the hyperfluidity in the urinary tract in cases of hydrocephalus, warrant raising the question of the possibility of some intimate connection between the kidney, and the choroid plexus of the brain? The frequency of kidney malformation in cases of craniorachischisis and exencephalon is also of note. Arrested development or absence of the suprarenal is also frequently a part of this type of maldevelopment. Some researchers have observed that almost every case of craniorachischisis shows absence of adrenal bodies. In the present group of cases, one adrenal associated with craniorachischisis was found, showing delayed development of the cortical zone. We are quite aware that the adrenal bodies are not an integral part of the urinary tract, but feel justified in including them in this report, since "in their embryological development their cortex is derived, at least in part, from epithelial outgrowths which proceed from the mesonephros." (Heisler.)

PERCENTAGE OF PATHOLOGIC LESIONS ENCOUNTERED

It is a striking fact that upon résumé of the entire material studied, only twenty-five cases, or 31.25 per cent were found entirely free from pathology. It is true, a group comprising 13.75 per cent of the cases showed only such slight changes as edema and passive congestion, but these also aid in confirming the evidence that the kidney is a vulnerable and exceedingly responsive organ from its earliest stages of development. In this series 68.75 per cent were abnormal, and of this number only nine cases presented negligible alterations. Let it again be recalled that the material was not selected, but all that was available during this short study period was used.

CONCLUSIONS

1. Evidence of chronicity becomes apparent at an early age, even in the early months of fetal life.

2. Blood vessel involvement is not a constant accompaniment of luetic changes in early life.

3. Kidney hemorrhages, both primary and secondary, are not rare in fetuses and young infants.

4. Fetal kidney inflammatory changes may be either acute or chronic, primary or secondary, infectious or noninfectious (chemical).

5. Malignant kidney tumors of sarcomatous nature are seen during the very early months of life.

6. Renal calculus occurs in early life. (Prenatal and early postnatal.)

7. The kidney in our opinion manufactures urine months before maturity of fetus, and probably in considerable quantity. Also the

fetus may develop a toxemia from retention, in its blood stream, of kidney products independent of the blood stream or kidney efficiency of the mother.

8. There apparently is a close relationship between the kidney and the brain in their development. Also between the brain and the adrenals.

Finally: Is there a faulty metabolism that fathers maldevelopments of the urinary tract or what is there that lends itself developmentally to malcoordination?

13300 Woodward Avenue.

BLADDER SURGERY IN RELATION TO THE FOURTH ERA OF SURGERY

By Robert T. Morris, M.D., F.A.C.S., New York, N. Y.

HUXLEY said that science committed suicide the moment it adopted a creed.

In the course of development of the third or pathologic era of surgery during which the methods of asepsis and antisepsis made greatest advance, a number of creeds became established. The rubber glove was accepted as belonging to the ritual of procedure in bladder surgery. It distinctly lessened the surgeon's tactile sense which is required to such a high degree when he is working out an enlarged prostate gland or finding minute fragments of concretions or determining the character of several kinds of changes in the bladder wall.

The fourth or physiologic era of surgery includes the idea of doing the gentlest and most rapid work without injury to the natural protective resources of the individual. In cases in which infection of the bladder has already occurred, well prepared hands do not carry any additional bacteria to the bladder in any harmful way. In cases in which there is no infection of the bladder at the time of operation, the more rapid gentler work that is done by well prepared bare hands lessens the degree of injury to normal tissue cells and conserves their natural defense.

Another injurious part of the technic of bladder surgery belonging to the third era included the creed that drainage tubes and connections with a sterile bottle beneath the bed were essential desiderata. As a matter of fact the bladder naturally resents the presence of any such shocking contrivance and patients were made very uncomfortable beside being distinctly injured at times by the addition of this feature of the management of their cases. A certain kind of drainage device is necessary in many cases in which posture will not suffice for giving a sufficient degree of natural drainage. A retention catheter must sometimes be used but when that is the case, it should be the smallest and softest one procurable.

For suprapubic drainage I do not feel that anything is required beyond a small drainage wick excepting in situations in which we are obliged to employ packing for the control of hemorrhage. In place of the cumbersome and distressing tube and bottle arrangement after suprapubic cystotomy, a very small drainage wick is preferable. The wound about the wick is protected by a couple of layers of iodoform

gauze. Upon this gauze is placed sphagnum moss for purposes of absorption of fluids from the bladder or wound.

Sphagum moss is inexpensive and may be purchased by the bale from any dealer in florist supplies. It is hard and dry in the bale, but any lot which is to be used for bladder dressing purposes may be first soaked in a tub of saturated solution of borax, squeezed as dry as possible and then kept in large jars ready for use. As a matter of convenience, handfuls of the sphagnum moss may be twisted up loosely in a single thickness of gauze and these little "balls" of moss are easily applied for suprapubic drainage purposes. They may be thrown away several times in the course of a day if necessary and a patient wearing this sort of drainage device may be sitting out of bed by the window reading his newspaper in comfort at the time when a patient with drainage tube and bottle accommodation is lying in distress in a bed to which he is confined.

In the fourth era of surgery which makes the least possible degree of drain upon the patient's strength we may choose the wick and moss drainage device. Sphagnum moss merely soaked in clean water and then squeezed nearly dry seems to have a certain inhibiting effect upon the development of microorganisms. Aside from any additional protection given by boracic acid or borax the layer of iodoform gauze which protects the immediate vicinity of the wound guards this area well enough.

Another feature relating to fourth era methods as opposed to those of the third era consists in discarding some of the beautiful and scientifically devised instruments for examination of the interior of the bladder by way of the urethra. If the patient were a horse and a dead one at that, this sort of instrumentation would represent a very high notch in artistic skill.

Our sentient patients, however, frequently sacrificed upon the altar of wonderful device and method, stand in abject terror of reapplication of cystoscopic methods in particular. There are situations in which there is no alternative. There are many other situations, however, in which a simple suprapubic cystotomy entailing almost no suffering may give all of the advantages obtained by way of elaborate urethral route investigations.

The third era surgeon's off-hand feeling commonly includes what seems to him a kindly act when he avoids suprapubic incision and in its place offers high class intraurethral observation and treatment.

The fourth era surgeon, however, equipped with simple ways for managing suprapubic cystotomy, is prepared to give his patient almost immediate comfort in an hour in some cases in which the suffering incidental to cystoscopic work might subject the patient's life to risk.

114 East Fifty-Fourth Street.

RENAL TUBERCULOSIS: DIAGNOSIS AND TREATMENT

By H. Dawson Furniss, M.D., F.A.C.S., New York, N. Y.

DIAGNOSIS

As MY work in urology has been entirely on the female, points germaine to renal tuberculosis in women only are discussed.

If one has in mind tuberculosis whenever a patient has hematuria, pyuria, frequency or renal pain, and clings to this idea until proved, or disproved by finding another cause for the trouble, he will miss few of the tuberculous cases. In the very early, and occasionally the very late cases, one may fail, but the majority are so plainly labeled tuberculosis that there is little excuse for error.

Renal tuberculosis is a chronic disease and slow in development. In my cases symptoms referable to the condition existed before diagnosis three months in one case and thirteen years in another, with an average of approximately four years. In 20 per cent there was a history of other previous tuberculous lesions that often antedated by a number of years, the symptoms of the renal trouble. Three of these patients had bone tuberculosis that had healed five years before the onset of urinary symptoms. It is possible that the kidney lesions occurred during the acute stage of the bone trouble and remained quiescent all this time. In 15 per cent there were healed or active pulmonary lesions and in two the pulmonary condition overshadowed the renal. In three there had been an old cervical adenitis. In none was genital or peritoneal tuberculosis discovered prior to operation, but one patient succumbed two years after nephrectomy to pulmonary and peritoneal tuberculous disease.

Vesical symptoms are usually the first complaint and in young virgins frequency of urination should excite a suspicion of tuberculosis. The irritation is at first slight but becomes progressively worse. The frequency is nocturnal as well as diurnal, in this particular differing from trigonitis and chronic urethritis. Slight pyuria may be noted early; later it is always present and rather well marked. Hematuria is often noted early, lasts usually a few days, and is I believe nearly always of vesical origin and associated with an acute exacerbation of the vesical symptoms. Later there is always a small amount of blood from the vesical granulation and ulcer, and rarely any from the kidneys. The cases vary in the degree of vesical involvement and consequently in the severity of the symptoms. Some have almost complete destruction of the kidney with only moderate bladder disturbance, and with others just the reverse occurs.

Renal pain, usually in the form of nephritic colic, at times a dull ache, occurs in 15 per cent. This is due to intermittent obstruction of an already indurated and strictured ureter.

Temperature was noted in only a few, and with these there was perinephritic abscess, ureteral obstruction, and lesions in other organs. The general health was good in 50 per cent, fair in 35 per cent, and poor in the remaining 15 per cent. When poor, bilateral involvement, renal insufficiencyy, or disease in other organs should be suspected. It is surprising how little uncomplicated unilateral renal lesions affect the general health. At times patients with unilateral renal tuberculosis have a toxic infection of the other kidney, which clears after nephrectomy.

Though one may suspect tuberculosis from the history, the diagnosis really rests on laboratory, cystoscopic—and at times x-ray, and other methods of physical diagnosis. The very early, and at times the very late, cases are the most difficult to diagnose.

The finding of tubercle bacilli in the catheterized urine of a woman is almost proof positive of tuberculous disease of at least one kidney. This statement is qualified with "almost" for the reason that tubercle bacilli are at times excreted by the healthy kidney without damage to itself. Should there be pus, blood, and impaired function of the kidney from which tubercle bacilli are excreted, a diagnosis of renal tuberculosis is warrantable. The bacilli can be found in at least 85 per cent of the patients either by slide preparation or guinea pig inoculation. I have had two instances of failure of guinea pig inoculation when the bacilli were discovered by staining. In some of the late cases, especially those where the ureter has become occluded, one fails to find the bacilli.

In the majority of our patients the cystoscopic appearances are so marked that to the experienced examiner they are as significant as pulmonary signs are to the skilled internist. There is induration of the ureteric meatus, in the early cases slight, but in the advanced quite marked. The orifice becomes irregular, the lips losing their elasticity and being rigid and nodular. There are varying degrees of perimeatal involvement, from simple induration to actual ulceration. The involvement of the ureter produces a shortening and consequent retraction of the meatus, often so great that it will be three-quarters to an inch behind its fellow. There is usually a "kissing" ulcer on the anterior wall, slightly lateral and on the opposite side from the affected ureter.

Except in greatly advanced cases the rest of the bladder is uninvolved—in these advanced cases the bladder capacity is almost *nil*, the outlines are so destroyed by ulceration that one part cannot be differentiated from another.

Should tubercle bacilli be found in the bladder urine, and the disease be so slightly advanced that changes have not been produced in the bladder that would indicate the kidney affected, both ureters should be catheterized and the origin of the bacilli determined. In those showing characteristic ureteral changes the suspected side is not catheterized but only the healthy one to prove that it is not diseased. We feel that catheterization of the known tuberculous side is harmful and that it gives no information not to be otherwise found. The combined function of the two kidneys is determined by phenolphthalein and blood chemistry, and the individual by injecting indigo carmine intravenously and watching the elimination through a simple cystoscope. Frequently the ureter of the healthy side is widely dilated; with the meatal lips flabby and not indurated, which will distinguish it from the tuberculous type. This is a retrograde dilatation due to back pressure, which back pressure is due to an almost constantly contracting bladder.

Where the disease is at all advanced the ureter of the involved side can usually be felt *per vaginam*, which is of value in determining the side or sides affected when cystoscopy is impossible. The size of the kidney is not to be taken too seriously in diagnosis. Very frequently the tuberculous kidney is not enlarged, is often reduced in size, and the healthy one may be the larger as a result of compensatory hypertrophy.

While the disease can be usually diagnosed by laboratory or cystoscopic methods, there will be found a few instances in which this is impossible; then x-ray examination may be of value in showing up this condition.

When the bladder is so involved that one is not able to determine the side affected, some have advocated exploratory operation upon the bladder to catheterize the ureter, or operation upon the kidneys. In such advanced bladder disease there is also such involvement of the ureters that they can be palpated *per vaginam* and one determine the side or sides affected. X-ray may be of possible value. I should hesitate to do an exploratory operation on the kidneys and then only when the general health was good or fair, the combined urinary excretion of phenolphthalein, and the blood chemistry near normal; I should explore the supposedly healthy kidney first. The condition of the ureter would more often indicate tuberculosis by its thickening than an inspection of the kidney itself, for many tuberculous kidneys have no surface indication of disease. If there was doubt, a specimen of urine could be obtained by ureteral catheter introduced through a small slit in the ureter or the pelvis. If such urine was pus-free, the probabilities would be against tuberculous infection. If pus is found, a specimen should be obtained, the wound closed

and the case kept under observation, until the question of the presence of tubercle bacilli could be determined. Fortunately one is seldom called upon to make an operative diagnosis. In the majority of instances a more accurate and comprehensive diagnosis can be made by the other methods above enumerated.

TREATMENT

Except in cases of miliary tuberculosis, renal tuberculosis is usually unilateral, at least at first. In the consideration of treatment of tuberculous kidneys, it is necessary to know the natural history and course of the disease.

The majority of the cases will progress to complete destruction of the kidney. A small number of these will have the kidney shut off from the urinary tract by stricture formation in the ureter, and of these a few will have the disease become stationary. It is this last class that are the so-called cures, but they remain potential sources of future trouble. With the cessation of drainage into the bladder the cystic symptoms are relieved.

Unfortunately with the progression of the kidney destruction there is usually an advance of the disease in the bladder which becomes severely ulcerated and greatly contracted, making the patient miserable and at times life almost intolerable. In neglected cases the second kidney may become involved either through the blood stream or by the ureter. The toxins from the tuberculous kidney are often the cause of nephritis on the other side.

A small percentage of the patients develop perinephritic abscesses.

The accepted treatment for unilateral renal tuberculosis is nephrectomy, providing there is no contraindication in other concurrent disease or renal insufficiency. The earlier the disease is eradicated, the better the chances of preventing further spread and of relieving the bladder condition. With one patient, who had tubercle bacilli in her right kidney urine (found three times) and none in the left, I was greatly chagrined to find a kidney with no discoverable tuberculous change. Since then I have made it a practice not to remove kidneys discharging only tubercle bacilli. There must be other evidences of involvement, such as pus, diminished function, thickened ureter, and ureteric meatal changes. As the disease is essentially a slowly progressive affair, one can well await the development of more evidence to warrant kidney removal and this without detriment to the patient.

With bilateral involvement some authorities have advocated removal of the kidney with the more advanced lesion. This does not seem warranted unless the better kidney has only slight lesions with good function and its ureter, with the part of the bladder surrounding it, is uninvolved. Even then, unless the patient was suffering acute

renal pain, or there was vesical intolerance, I would withhold operation.

In regard to operation the chief questions involved are drainage and treatment of the ureter. Unless there has been soiling of the wound from rupture of the kidney, or persistent oozing, I refrain from drainage, and when draining use rubber tissue for twenty-four hours for oozing. If the wound has been soiled a split rubber tube is used for twenty-four or more hours, depending on the degree and character of the soiling. When there is perinephritic abscess the kidney should be removed if not unduly risky. If there are great technical difficulties drain the abscess.

Unless there is marked involvement of the ureter, or low stricture with dilatation above, the ureter is divided with a cautery, ligated and dropped. Under the other conditions, the ureter is removed to a point just above the bladder. In my experience a sinus is as apt to form after ureterectomy as after high division.

In one patient on whom I did a ureteronephrectomy there developed a sinus, subsequent involvement of the second kidney, a progression of the cystitis, and discharge of urine from the bladder through the stump of the ureter into the sinus and onto the skin. In this particular case the ureterectomy permitted discharge from the bladder which otherwise might not have occurred.

About one-third of the patients develop a sinus, and this seems to follow in the drained as well as the undrained. Nor does resection of the ureter, except in the class of cases above mentioned, seem to favorably influence this complication. In the drained cases the sinus is noted usually during the hospital stay; in the undrained it makes itself manifest about the fourth week when they are home. This gives the undrained cases a seemingly apparent, but false, advantage. While a disagreeable complication, I have seen no harm come from it. They close spontaneously on the improvement in the general condition, though this may take from a few weeks to several months and occasionally a year or more.

In nearly all the patients there has been a postoperative rise of temperature, lasting from 24 hours to several days, with an exacerbation of all other tuberculous lesions. This I have interpreted as a tuberculin reaction, exactly similar to that after injection of tuberculin. With the first that had a severe reaction I opened the wound on a hunt for pus. The hunt was unsuccessful but the wound healed slowly with a sinus and a hernia, the only one I have had sufficiently well marked to be troublesome.

The after-treatment of these patients consists in measures to build up the patient's general health, to spare the remaining kidney overwork, and to clear up the cystitic lesions. Good results have been

obtained by irrigating the bladder with boric solution in the acute stage, 2 to 3 per cent carbolic acid later. For persistent ulcers fulguration hastens the healing.

For the bilateral, or otherwise inoperable, cases much can be done for the bladder comfort in the way outlined for the postoperative vesical treatment.

Renal tuberculosis is usually unilateral, and when so, there is a favorable response to nephrectomy in the relief of kidney and bladder discomfort, and a betterment of the general health.

54 East Forty-Eighth Street.

DISCUSSION ON THE PAPERS OF DRS. BROWN, MORRIS AND FURNISS.

DR. JOHN OSBORN POLAK, Brooklyn, New York.—I know of nothing that is more illuminating than to be told that of the 80 babies the doctor dissected, 63 per cent of them, if they had lived, would have started life with impaired renal function.

DR. ROBERT T. MORRIS, New York City.—In reference to the paper of Dr. Furniss concerning tuberculosis of the kidney, I wanted to try the Bier hyperemia principle in tuberculosis of the kidney. With the idea of ligating the renal vein later, I injected the kidneys of a series of rabbits with tubercle bacilli. At the end of two or three weeks the rabbits were showing the effect. I opened two rabbits and found tuberculosis was well under way, but I was not quite ready to tie the renal vein to carry out the experiment. When I returned after a prolonged period the attendant at the laboratory said the rabbits were all getting hungry and making love in a perfectly natural way. I opened the rabbits that were getting over the tuberculosis by themselves in order to watch the condition. I closed up all but two. In examining them at the end of three months I found there was not one that was not perfectly well. The fact that tuberculosis had progressed up to the point of making the rabbits very ill, and then the rabbits overcame the effect and got well without any treatment is an extremely important point to remember.

DR. JAMES N. WEST, New York City.—Apropos of this subject, I would like to say that about four years ago I had a patient in whose case a diagnosis was made of tuberculous kidney and bladder. The patient suffered a great deal with frequency of micturition; she had lost considerable weight. A good many men have written articles on the early diagnosis of tuberculosis of the kidney and the necessity for it without giving anything further of what they should do when they made an early diagnosis. I placed this patient under such treatment as one would for pulmonary tuberculosis. I carefully instructed her about her health, her diet, and exposure to the sunshine and the fresh air. She was a very faithful patient and carried out my instructions very literally. In a little over a year this woman gained twenty pounds in weight; she looked fairly well but suffered a great deal with her bladder, and she still had from time to time a good deal of pain. She did not sleep well, and looked rather cachectic in spite of an outdoor life, although she had gained in weight. I determined to remove the kidney and a part of the ureter, which was much diseased. I found this kidney was but little more than a shell; it was not functioning; it was purulent and after removal that woman has made a recovery. At present her bladder does not disturb her very much. Her health is much better in every way.

DR. G. VAN AMBER BROWN, Detroit, Michigan.—Dr. Furniss made a comparison between the value of laboratory methods and the use of guinea pigs in

making a diagnosis of renal conditions. I agree with his statements in this connection. In the literature within the last year I was impressed with the report of four kidneys removed on a diagnosis of tuberculosis, which upon microscopic examination failed to show tubercle bacilli. In these cases the diagnosis had been based on inoculation of guinea pigs. The animals may have been tuberculous at the time of inoculation. In two cases nonmalignant tumors of the kidney caused the symptoms, and in two others the kidney was normal but there was a slight apical tuberculous process.

DR. FRANCIS REDER, St. Louis, Missouri.—I wish to refer to sinus formation after the kidney has been removed and the healing process about completed. The operation of nephrectomy for a tuberculous condition is one of the most grateful operations. Bladder symptoms, which are frequently secondary, usually disappear after the kidney has been removed. But there is sometimes a distressing feature as a sequel to a nephrectomy for a tuberculous lesion, namely sinus formation. It does not seem to matter much how the stump of the ureter is treated, whether it be treated with a cautery, or whether it be treated with a carbolic acid application, a sinus quite often follows. When Dr. Furniss says the sinus will heal in two or three months, or in a year and a half, it is encouraging for those who meet with this condition. I have several cases on hand at present, one dating back three years. One of these cases was very much dissatisfied and went to the Rochester Clinic two years ago, where an extensive operation was performed. For several months matters looked encouraging, then the sinus again appeared and is active at present.

The best results obtained in the treatment of this condition have been with the injection of bismuth paste (Beck) somewhat stronger, however, than the original formula. With this paste I can usually keep the sinus closed from four to eight months.

DR. JAMES E. DAVIS, Detroit, Michigan.—All who have looked over the literature upon the pathology of the kidney will be at once convinced that there is much to be settled. The classification of kidney findings is in many ways unsatisfactory. I think it is of very great importance to have a research study upon this subject recorded before this Association.

The amount of work Dr. Brown has done I think needs special commendation. The material that he has worked upon is excellent, and it offers much in the way of promise that will go far toward settling or helping to settle some of the problems we now have in an unsettled condition.

This kind of material is always abundant. We can always have plenty of bodies of young children to study. It is rather tedious to sit down and make a careful study of the morphology. It is likewise more tedious to make a careful microscopic study of kidney tissue from young subjects. The preservation of this material is exceedingly important. Unless made at least within two hours after death, it will not give reliable material for a careful study. The kidney should be preserved at once; it should be sectioned so that the preservative fluid will reach all parts of the tissue, and the most searching study should be made of different parts of the kidney.

A very important phase of the subject that Dr. Brown has mentioned comes in connection with the infections of early childhood. During the first decade of life most of the infections are encountered, and it is my firm belief that we have a beginning permanent pathology of the kidney laid down during this period. It is true, the changes are so minute that frequently we are unable to be quite sure of their presence, but I am sure that when our studies are carefully done, and we look into the condition of the terminal arteries, and are able to recognize the changes that go on there after or during every infection, and consider the aggregate of in-

fections that come during the first decade, we will then understand how later on we are going to have some of the surprises that are clinically spoken of as "clouds in a clear sky." No one suspects kidney pathology in this or that case, but the reason for the condition was an injury sustained in the first decade of life.

DR. STEPHEN E. TRACY, PHILADELPHIA, PENNSYLVANIA.—We should ever be on the alert to recognize renal lesions. Undoubtedly there are many unnecessary operations done on the abdominopelvic organs when the pathology is in the renal system. Many patients with a calculus in the ureter have been operated upon for chronic appendicitis. Some years ago a patient who suffered with abdominopelvic symptoms, consulted a gynecologist who repaired some lacerations; the symptoms continued. She then consulted a surgeon who removed the appendix; the symptoms were in no way modified. She later consulted another surgeon who removed the gall bladder; the same symptoms continued. The patient had a tuberculosis of the left kidney, ureter and bladder. The kidney and entire ureter were removed. After the operation the capacity of the bladder increased from 30 to 600 c.c., and she remained in good health for four years when she developed a large ovarian cyst which was removed. She is now in excellent health twelve years after the nephro-ureteroectomy.

Recently we had a similar case. The appendix was removed by a general surgeon. The symptoms continued. Three months later the abdomen was opened by another surgeon for the separation of adhesions which were not present. She was in no way benefited by the operation. She had a tuberculosis of the right kidney and upper portion of the uterus. The ureter was strictured at the bladder. The kidney and the involved part of the ureter were removed and she had a rather rapid convalescence.

The discovery of tubercle bacilli in the urine without other symptoms of a renal lesion is not sufficient evidence on which to base a diagnosis of tuberculosis of the kidney. When operating for a tuberculosis of the kidney and the ureter is involved, if the condition of the patient will permit, the entire ureter should be removed. By so doing the convalescence will be shorter and if a sinus develops, it will heal more quickly.

DR. G. VAN AMBER BROWN, DETROIT, MICHIGAN.—I want to again refer to the edematous twin baby mentioned in my report. This case stimulated me to institute an inquiry in regard to the circulation of the blood of the mother in relation with the circulation of the blood of the fetus, that is, do they intermingle and how intimately do they come in contact? Also how much influence does the kidney efficiency of the mother have upon the baby? Through the courtesy of Dr. George J. Reberdy, of Detroit, I am privileged to cite this case. The patient was first seen April 5, 1922, and delivered the following day, April 6. Menstruation normal, never ill except in childhood. She weighed 150 pounds; had a blood pressure of 122 over 80, and was apparently in good health. Colostrum was present; the position was L. O. A.; fetel heart 140, clear. The measurements of the pelvis and vagina were ample. The woman was twenty-eight years of age, an American, with no occupation. Time of labor 18 hours, spontaneous delivery. The patient has used morphine habitually for eight years. On the day of confinement she had taken sixteen grains, by hypodermic injection, her daily consumption of this drug. Naturally there was much speculation as to the kind of baby she would produce. The child cried lustily, weighed five pounds twelve ounces; was normal in development, but after placing the child to the breast it became stupid and gave evidence of morphine poisoning The baby gradually failed and after some days died. Evidently absorption of the morphine had taken place in that child from the milk of the mother.

At Providence Hospital phenolsulphonephthalein and indigo carmine were injected intravenously into a number of women, at three hours, two hours, one hour, and a

few minutes before delivery of their babies. The babies were watched for twenty-four hours afterward during which time every bit of urine was collected, and in no instance was there any evidence of the phenolsulphonephthalein or the indigo carmine passing from the mother into the urine of the child. Yet we have the evidence, as shown in the edematous twin, of the kidneys of a fetus at six months being very active indeed, followed by death of the fetus from suspension of its kidney function produced by back pressure caused by the imperforate urethra. This linked with the phenolsulphonephthalein and indigo carmine tests is strong evidence indicating the lack of intermingling of the blood stream of the mother and fetus. It further raises the question—are any substances borne from mother to child by the blood stream and if so what? Luetic fetal kidneys do not show medial and adventitial blood vessel proliferative changes that adult kidneys show but the infection manifests itself by proliferation of the interstitial connective tissue. Is this due to the lack of specialization of the connective tissue or is it due to the failure of spirochetal dissemination by way of the circulatory system of the kidney?

DR. FURNISS (closing).—In Dr. Brown's collection there are a large number of malformations, representing a considerable percentage compatible with good health especially duplications of the ureter and of horseshoe kidneys. These will not become apparent unless some disease of the urinary organs occurs which would make investigation necessary. Evidently there is a greater percentage of duplication of the upper end of the ureter than of complete duplications from the kidney to the bladder. These are difficult to discover except by pyelography, or where the surgeon has catheterized the ureter a number of times and gets pus at one time and clear urine at another. I have seen 26 cases of complete duplication of the ureter. In two cases the ureters opened extravesically. One I anastomosed into the bladder from the vagina. In the second case a supernumerary ureter drained a portion of the kidney, not bigger than a small hickory nut. I resected that portion of the kidney with little difficulty and a most satisfactory result.

THE IMPORTANCE OF PALPATION OF THE PELVIC URETERS IN THE DIAGNOSIS OF ABDOMINAL DISEASE

By David W. Tovey, M.D., New York City

PALPATION of the female pelvic ureter is a much neglected method of diagnosis. Max Sänger in 1886 showed the pelvic ureters could be palpated, but it is easier to palpate diseased ureters.

At the New York Polyclinic I had no difficulty in teaching students to palpate the ureters, after they had learned their positions by inserting catheters into them. During vaginal examinations there is nothing between the ureter and the finger but the vaginal wall.[1]

Frequently cases in which the diagnosis has not been made, a thickened tender ureter palpated through the vagina, will give a clue to the diagnosis. The lower part of the ureter becomes thickened and enlarged in diseases of the kidney. Because it takes part in the involvement in the inflammatory process, dilatation also occurs and is the result of contagious infection.

Changes in the wall of the ureter are always present whenever pyelitis exists (Braasch[2]).

In mechanical dilatation the ureter is thickened below and dilated above the point of obstruction. The changes in the ureteral meatus, seen through the cystoscope described by Fenwick in 1903, which he claimed afforded a clue to the nature of the diseases of the kidney, are due to the changes in the lower part of the ureter. Pain in the region of the kidney, radiating to the lower abdomen, genitals and thighs, is typical of renal or ureteral affections, but it is often absent. Abdominal pain, not associated with pain in the back, and without urinary symptoms is frequent. Pain due to disease of the urinary tract, may be intensified in different regions of the body, the explanation of which must be sought in the nerve plexuses and anastomoses with other nerve plexuses; also in the contact of the kidney and ureter with different abdominal organs and the extension of disease from these organs.

The ureter is supplied by the aortic, renal, ovarian, superior and inferior mesenteric, hypogastric, vesical lumbar and sacral plexuses.

The above named plexuses anastomose with each other and with all abdominal sympathetic plexuses, connecting the ureter, through the nerve plexuses, with all abdominal viscera.

The anastomosis of the nerve plexuses of the ureteral and uterine plexuses, explain the reflex pain and bleeding due to ureteritis. Anastomosis with the mesenteric plexuses, pain in the gall bladder,

stomach, intestines and appendix, with the vesical plexus pain in the bladder, urethra, with ovarian pain in the ovaries, hypogastricus pain in the genital tract, renal pain in the kidney, sacral pain in the rectum, pelvis and thigh, with intercostal pain in the abdominal wall. Lesions of the kidney and ureter may simulate every abdominal and pelvic disease from gallstones and ulcer of stomach to cystitis and ectopic pregnancy.

Hunner[3] diagnosed 500 cases of ureteral stricture in three and a half years. He concluded—it is the cause of more kidney pathology than any other factor, and a frequent cause of unnecessary, abdominal operations.

Frequently there is no pain referred to the urinary organs, only repeated attacks of epigastric distress, and at times fever. Pain may be referred to any organ, in the abdomen, and to any part of the abdomen.

In lithiasis the position of the stone, whether in the kidney or the ureter, has little bearing on the distribution of pain. A stone in the kidney may give pain, limited to the lower abdomen and vulva; and stone in the lower part of the ureter may give pain in the renal region or high in the abdomen.

Braasch[4] reports 10 per cent of cases operated by Mayo for stone had no definite pain.

Bugbee[5] says: "It is possible to make a diagnosis with x-ray and ureteral catheter in only two-thirds of the cases." Out of 76 cases of calculi in the lower ureter not showing a shadow, 22 passed calculi.

Barney[6] reports 18 per cent of his cases of ureter calculi had one or more previous operations and remarks: "These mistakes were made by skilled surgeons, with every facility, for arriving at a correct diagnosis." He says "Abdominal exploration is sometimes necessary to differentiate between lithiasis, and acute conditions of the abdomen. Urine is negative in 8 per cent and x-ray 6 to 11 per cent of cases. The pelvic ureter is always thickened and palpation will give a clue to the diagnosis.

Krestschimer[7] reports 44.5 per cent of his pyelitis cases were operated on for some abdominal condition.

Cecil[8] that 30 per cent of this hydroureter and hydronephrosis cases had abdominal operations for the relief of pain, subsequently demonstrated to have been of renal origin.

Green[9] in an article on the stricture of the ureter as an explanation of obscure abdominal conditions says: "The diagnosis is made by urinary symptoms and by palpation revealing tender spots low down in the broad ligament."

Sanes[10] says: "The terminal three inches of pathologic ureter can be felt as a tender tube along the anterior and lateral fornices of the vagina."

In tuberculosis of the kidney, frequently the only symptoms present are a dull ache in the lumbar region with frequent urination.

In 1903 Bazy described as diagnostic of tuberculosis of the kidney, the reflex pain on touching the ureteral meatus, through the vagina or rectum.

Bugbee[11] found that a large percentage of his tubercular cases had stricture, and that a thickened irregular ureter could easily be palpated through the vagina.

Ureteritis due to infections of the cervix are frequently mistaken for cystitis. In 1886 Sänger[12] reported cases of ureteritis, treated for long period of cystitis.

In an article read before this Association on the "Female Pelvic Ureters"[13] I said ureteritis due to lacerations and infections of the cervix, if treated early, will not result in stricture. Bladder symptoms following hysterectomy are frequently due to ureteritis and not to cystitis. Palpation of the pelvic part of the ureter will give the clue to the diagnosis.

TECHNIC OF PALPATION

To palpate the ureter from the ureteral orifices at the trigone, to the base of the broad ligaments it is first necessary to orient the position. Imagine a line from a point half an inch in front of the cervix, to a point about half way between the lateral border of the cervix, and the lateral pelvic wall. The vaginal fingers are introduced into the anterior lateral vault of the vagina. Counter pressure is made downward through the abdominal wall. Draw the fingers by moving them toward the broad ligament or toward the felt as a flattened cord-like body, smaller than a goose quill, displaced in its bed of loose cellular tissue, as it slips through the fingers. It can be rolled from side to side under the palpating fingers by moving them toward the broad ligament or toward the bladder, posterior to the broad ligament. It is felt above the spine of the ischium covered by peritoneum, by palpating it against the pelvic wall.

Judd[14] advises sweeping the fingers above its location as in picking a guitar, always from above downward. It may run as high as an inch above the spine of the ischium.

The normal ureter never causes pain, on palpation; if diseased, it is enlarged and feels like a hard cord, sometimes as large as a lead-pencil or even larger. Palpation brings an intense desire to urinate. It is easy to distinguish a diseased ureter by comparing it with its fellow which is rarely diseased, or if diseased at all, never to an equal extent.

REPORT OF CASES

Case 1.—U. S., aged twenty-five years. Temperature 104°. Nausea, epigastric distress, pain and tenderness in region of the appendix. Appendectomy advised by her physician. Examination by vagina. Right ureter enlarged, tender—Palpation brought intense desire to urinate. Left ureter enlarged, tender, but not as large as the right. Diagnosis of pyelitis confirmed by examination.

Case 2.—M. H., aged thirty-two years. Pain in left ovarian region worse at menses. Sent for operation. Left ureter enlarged and tender. Diagnosis of ureteritis due to stricture confirmed by ureterpyelogram.

Case 3.—S. U. Dr. Wells. Acute pain and tenderness in gall bladder region chill, fever, nausea and vomiting. Sent for gall bladder operation. Right ureter was enlarged, and tender. Passed stone the size of a shoe button after ureteral catheterization.

Case 4.—K. Tumor in right side of abdomen, diagnosed as enlarged gall bladder, Frequent urination, with blood in urine attributed to inflamed ureteral meatus. x-ray negative. Right ureter enlarged, tender. Collargol picture revealed a soft stone the size of a plum in the kidney pelvis. Large pus kidney removed with a very soft stone at operation.

Case 5.—D. Dr. Wells. Sent to Polyclinic with diagnosis of ectopic pregnancy—menses three months ago. Complains of severe pains in right ovarian region, accompanied by spotting. Uterus enlarged to size of a two and a half months' pregnancy, right ureter enlarged, tender, Diagnosis: Pregnancy with ureteritis and pyelitis.

Case 6.—F. S., twenty-nine years. Sent with diagnosis of ectopic pregnancy. Last menses two and half months ago, irregular bleeding with attacks of severe pain in right ovarian region, nausea and fainting. Says pain feels as if it was in a tube like a banana in her pelvis. Examination: Uterus enlarged and softened, and is the size of a two and one-half months' pregnancy. In the left cornu there is a hard mass the size of a plum. Bloody discharge of brownish color from vagina. Right ureter enlarged, very tender, palpation gave intense desire to urinate. There was a cramp-like pain in the abdomen with nausea and faintness. Diagnosis: Pregnant two and one-half months, in left cornu. Ureteritis due to stone.

Case 7.—D. S., sixty years. Large kidney-shaped mass on left side below ribs extending into kidney region. Palpation revealed a normal ureter. Ureterpyelogram showed a normal ureter and kidney pelvis. A large sarcomatous spleen was removed at operation. One of my colleagues who saw the case in the anesthesia room, said to the patient's physician: "That is a large kidney. You make Dr. Tovey make an incision in the kidney region."

Case 8.—J. U., thirty-five years. Since birth of a child three years ago, indigestion, pain in the right abdomen, frequent painful urination. Treated for cystitis and advised to have her appendix and ovary removed. Examination: Cervix lacerated, eroded and infected. Right ureter enlarged and tender. Diagnosis: Ureteritis to cervicitis.

Case 9.—M. P., thirty-five years. Attack of severe pain referred to right iliac region, severe nausea, epigastric distress, frequent and painful urination. Her physician thought he felt an enlarged appendix. Right ureter enlarged to the size of a finger, and was very tender. Diagnosis: Tuberculosis of kidney confirmed. The enlarged appendix her physician felt was a tubercular ureter.

CASE 10.—J. R., twenty-five years. Complains of pain in the right side, indigestion, constipation, epigastric distress, appendix. Lane kink and right ovary removed without relief. X-ray findings and urine negative. Palpation revealed a hard tender mass in right lower ureter, pressure on which brought intense desire to urinate. Diagnosis of stone in lower ureter confirmed by examinations.

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240 RIVERSIDE DRIVE.

HEMORRHAGES IN THE NEWBORN

By Lucius A. Wing, M.D., New York City

WITHIN the past decade, the closer study and observation of the newborn infant revealed a greater incidence of abnormal conditions than was formerly recorded. Aside from anomalies of development, these conditions are chiefly traumatic in origin, and their subsequent course is dependent upon the degree and character of the injury, upon the vitality and adaptability of the individual infant, and upon early recognition and treatment in certain cases.

Of conditions affecting the newborn intracranial lesions associated with hemorrhage are of great importance, not only because of their frequency and high mortality, but on account of the permanent damage which results in many of the survivors.

Kearney, in a recent report of the examination in New York of 480 children with cerebral spastic paralysis, with or without mental deficiency, states that intracranial hemorrhage at birth is responsible, pathologically, for 70 per cent of the spastic type of paralysis in children, and for 20 per cent of the idiocy and feeblemindedness now existing.

He observes that, with a knowledge of these statistics, it is a prime consideration in present day obstetrics that every means be employed to minimize the chance of injury to the infant's cranium and its contents.

As has been ably pointed out by Ehrenfest, the frequency of fatal intracranial lesions is far greater than even recent infant mortality records would indicate. Many infant deaths, ascribed to asphyxia, are in reality due to intracranial or other injuries, the exact character of which can only be determined by a properly performed autopsy. It should be emphasized that fatal intracranial hemorrhage may occur in an infant born spontaneously, in what is considered a normal labor.

According to time of onset, hemorrhages in the newborn may be divided into two main groups: first, those occurring during or immediately after birth; and secondly, those occurring or manifesting symptoms after a period of some hours or days.

1. We may first consider the cases of intracranial trauma with gross hemorrhage.

Various observers report more or less extensive subdural intracranial hemorrhage in from one-third to one-half of the autopsies upon stillborn infants, and in those dying in the first few days of

life. In addition to hemorrhage, other traumatic effects are frequently present in cases of this type.

In 59 fatal cases of intracranial hemorrhage, 20 of which were breech and 39 vertex cases, Browne observed tearing of the tentorium cerebelli in 37 per cent, 63 per cent of which were in breech deliveries.

Losee has tabulated the location and extent of the hemorrhage found at autopsy at the New York Lying-In, in a recent series of 69 cases of intracranial hemorrhage, as follows:

Over both hemispheres,	10 cases
Over one hemisphere, and beneath the tentorium,	12 cases
Bilateral and beneath the tentorium,	16 cases
Bilateral, beneath the tentorium, and in the ventricles,	23 cases
Beneath the tentorium and in the ventricles,	7 cases
Epidural	1 case

The same observer, in autopsies over a period of ten years at the Lying-In Hospital, has observed fatal intracranial hemorrhage twice as frequently in breech extractions as in forceps operations.

Intracranial hemorrhage, occurring during and immediately after birth, may be due to the direct tearing of blood vessels in various regions, or to the rupture of thin-walled vessels by increased pressure from within.

Death, if it ensues, is due to compression of the medulla through general increase in intracranial pressure, or to more localized pressure, if the hemorrhage is beneath the tentorium.

Nature has admirably protected the infant's delicate cranial contents from the traumatic effects of the forces of labor, provided the normal vertex mechanism prevails, and there is no disproportion.

With proper engagement and progress of the head, the forcible contractions and thrust of the uterus are balanced, so far as the infant's head is concerned, by the firm support of the birth passages.

By virtue of this support of the maternal tissues, increased intracranial pressure and disruptive intracranial effects are minimized, as the cranial contents are largely fluid and noncompressible.

It follows, as a matter of mechanics, supported by clinical observation, that more intracranial injury may result in a few moments during a hasty or unskillful forceps operation, or similar attempt to extract an aftercoming head, than may result from some hours of strenuous labor with normal vertex engagement.

The hemorrhage following difficulty in the extraction of the aftercoming head is usually in a dangerous location, being most frequently found beneath the tentorium, or in the region of the medulla, and often associated with tears of the tentorium.

Babies with subtentorial hemorrhage are frequently stillborn. If respiration can be established, the infant may survive, but death in from a few hours to several days is most often observed. The clinical appearance of these infants is most typical; they are limp, have a squeaky, high-pitched cry, the respiration is irregular, and they often show alternating periods of pallor and cyanosis.

Intracranial hemorrhage following vertex cases is more often observed over the cortex, due to rupture of the cortical veins; the prognosis in these cases is usually better. In the more severe types, however, the hemorrhage is often bilateral, within the ventricles, and more or less diffuse within the cranial cavity, and the course is similar to the preceding subtentorial type, through compression of the medulla.

It is not within the scope of this paper to discuss in detail the diagnosis, prognosis or treatment of these severe types of intracranial trauma. In general it may be stated that in the more extensive lesions, the infant is either stillborn or dies shortly after birth.

Intracranial lesions of greater or lesser degree, may be suspected in all babies showing asphyxia at birth, in whom resuscitation is difficult, or when prolonged efforts are necessary to establish respiration, and particularly when the latter shows irregularities after establishment.

It may be emphasized at this point, that only the gentlest manipulations are permissible in attempting to establish respiration.

The prognosis, both as to life and future health, in babies with intracranial trauma, depends on the anatomic location and the extent of the ensuing hemorrhage.

The treatment of these infants may be considered in the prophylactic sense, by avoidance where possible of sudden or severe pressure on the child's head through any agency or procedure.

Surgical treatment by decompression, relief of intracranial hypertension by lumbar puncture, and the administration of blood or serum where hemorrhagic tendency exists, are modes of treatment applicable to suitable cases.

2. Asphyxia, without gross intracranial hemorrhage, is recorded by various observers, in about one-half of the stillborn. In this group of infants, Losee and others have observed quite constantly the presence of capillary hemorrhages in various localities, chiefly over the cerebral cortex, the epicardium, the capsule of the liver, the pleura, the retina and beneath the conjunctiva. Many babies survive and do well, who have shown at birth marked asphyxiation with delayed establishment of respiration, and it may be presumed that capillary hemorrhages occur in many of the survivors.

Should these infants develop an early blood instability, it is probable that fresh bleeding occurs in some areas where capillary hemorrhage has previously taken place.

Although it has not been demonstrated that asphyxia alone has a marked influence on the development of hemorrhagic tendency, yet it would seem wise to regard infants in this group as potential bleeders, and to keep them under very close observation. Frequent observations on bleeding and clotting time should be made upon infants of this type during the first week after birth.

Recently we have determined the bleeding and clotting time by the Rodda method in a series of twenty-five infants, delivered by some operative procedure after abnormal labors in which were observed disturbed fetal heart action, the passage of meconium, or other evidences of fetal distress. No infants were included in this series which showed definite intracranial injury at birth, but all showed a greater or lesser degree of asphyxia, with some delay in establishing respiration.

Bleeding and clotting time determinations were made by the Rodda method on each of the twenty-five infants on the first, third, fifth, seventh, and ninth days postpartum. At some period during the examination the coagulation time was found delayed in seven cases, it was found normal at each examination in the remaining eighteen cases. The bleeding time was found normal at each examination in twenty-four cases. In one case the bleeding time was found prolonged on the third day, but became normal again on the fifth day, and this infant presented no clinical symptoms of hemorrhagic disease at any time. All the infants in this series were discharged from the hospital in good condition. It may be noted that seven of the twenty-five infants showed a transient delay in coagulation time, a higher ratio than is usually observed in normal infants.

3. Hemorrhages developing in the newborn some hours or days after birth, are usually associated with hemorrhagic diathesis.

Autopsies upon cases of this type, in which death was due to intracranial hemorrhage, will usually show hemorrhage in other parts of the body, particularly in the lungs and in various abdominal organs, especially the suprarenals.

Rodda and others have shown that the normal newborn infant, exhibits a progressive lengthening of bleeding and clotting time during the first few days after birth, reaching its maximum on the fourth to the sixth day, and returning to normal from the eighth to the tenth day postpartum.

The normal clotting mechanism of the blood is a somewhat complex phenomenon, and the etiology and pathology of hemorrhagic disease of the newborn are not definitely understood. It is a well-established

clinical observation, however, that a certain number of newborn infants fail during the first few days of life to maintain a proper stability of the blood. I believe that we have evidence that parturitional trauma and exhaustion have a decided bearing upon this loss of blood stability. Losee and the writer have observed a number of these infants at the Lying-In Hospital, and have been impressed with the abruptness with which symptoms may develop in an infant whose previous condition had seemed quite good. A certain number of infants in this group are born following normal labor, a certain number are premature, but the majority, in our observations, have been babies born after long hard labors, or operative deliveries. We have come to regard all such infants as potential bleeders and to observe them very closely for the sudden development of intracranial hemorrhage. Symptoms most often develop in the third, fourth or fifth day postpartum, and in the first few hours are not always clearly indicative of an intracranial lesion.

Among the earlier symptoms observed are loss of eagerness or of ability to nurse, listlessness and pallor. A little later the cry becomes higher pitched, the infant shows some spasticity and often slight retraction of the neck. The anterior fontanelle usually shows increased tension. Nystagmus is often seen and also changes in the fundus.

Later, convulsions and respiratory symptoms develop if the hemorrhagic area increases, and death ensues through paralysis of respiration.

Delayed bleeding and clotting time will be observed in these infants, usually from the onset of clinical symptoms. In some of the infants, however, bleeding and clotting time changes did not appear until after definite clinical symptoms were present to a marked degree.

Early recognition and treatment before the more serious symptoms develop is very important in these cases, and treatment should not be delayed in cases where blood changes are indefinite by laboratory test. At the Lying-In Hospital, the subcutaneous injection of human serum, as a therapeutic measure, has proved very effective, if given early. The usual dosage is 100 c.c. in the first twenty-four hours, divided into three or four doses, injected subcutaneously in the dorsal region at intervals of four to six hours. During the second twenty-four hours, fifty to sixty c.c. of serum are given in the same way, if it seems advisable.

Whole blood may be used instead of serum with equally good result, but whole blood is not absorbed as rapidly as serum and is more prone to cause irritation at the site of injection. Outside of hospitals, the administration of whole blood is preferable, on account of simplicity of technic.

The improvement in general condition and the abatement of cerebral symptoms following the administration of serum is often very rapid and satisfactory, if the serum is given early. No typing is necessary for the subcutaneous administration of blood or serum, and we have observed no unfavorable reactions following their use.

4. A certain number of newborn infants develop hemorrhagic disease of the type which has been recognized clinically for a considerable period. These cases are characterized by the development within the first few days after birth of hemorrhages beneath the skin, bleeding from the mucous membranes, the cord and elsewhere. Intracranial bleeding may or may not occur, and these cases if untreated, die from the general loss of blood, rather than an intracranial lesion. Birth trauma and prematurity appear to have an influence upon the development of this condition. These infants show marked lengthening of the bleeding time and delayed clotting time of the blood.

In a series of 21 cases of hemorrhagic disease of the newborn observed at the Lying-In Hospital by Losee and the writer, 11 cases were operative deliveries, as follows: Six forceps applications, one breech extraction with dry labor in an elderly primipara, and four internal podalic versions and breech extractions, three for pelvic deformities and one for prolapsed cord. In several of the remaining ten cases, the mothers had long hard labors, but were delivered spontaneously. These twenty-one cases were all of the typical well pronounced type of the disease, and were treated by blood transfusion or the subcutaneous injection of human serum. One baby in the series died of cerebral hemorrhage and anemia, the others completely recovered. Twelve of these babies have been followed for a year or longer, these have developed normally and have shown no recurrence of bleeding tendency. Transfusion, with either unmodified or citrated blood, controls the bleeding tendency more rapidly than the subcutaneous injection of whole blood or serum, and restores the blood already lost by the infant but necessitates some delay for typing and preparation.

In concluding these observations on the subject of hemorrhages in the newborn, the following points may be emphasized.

1. Hemorrhages developing in the infant during birth or shortly after, are of greater frequency than was formerly believed; they often occur in babies born spontaneously.

2. Sudden or severe compression of the child's head, either by the natural forces of labor or by some obstetrical procedure, is the chief mechanical cause of intracranial lesions.

Asphyxia of the infant during birth has an influence on the stability of the blood and impairs the clotting power. This renders these in-

fants especially susceptible to both immediate and delayed hemorrhagic lesions.

3. Therapeutic measures, to be effective in these cases, should be employed early in their development; the attending obstetrician should thoroughly appreciate his responsibility for the early recognition of hemorrhagic conditions in the newborn.

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THE DEFENSELESS AREAS OF THE ABDOMEN

By George W. Crile, M.D., Cleveland, Ohio

In the evolution of man and animals defense mechanisms were developed only in those parts which were frequently subjected to injury. Therefore, in deeply protected tissues and in those whose injury inevitably causes death, infection works its way painlessly and relentlessly, undeterred by local resistance. This is true of all the deep seated areas, which have no direct connection with the outside world. Thus below the surface of the abdomen, the power of resistance to infection diminishes in direct relation to the depth of the tissue below the surface. The great vascular trunks which lie deep within the abdomen show little resistance to infection, although these same vessels, when in their course they emerge to more exposed positions, do react to infection by swelling, pain and the other symptoms which are common in inflammation of frequently infected tissues. Thus, an abscess may progress unheralded within the unprotected regions of the abdomen,—in the subphrenic area, in the large retroperitoneal space, within the liver itself. The lack of response in these areas is in marked contrast to the immediate violent defense which is manifested in the protected abdominal regions.

An acute perforating appendicitis, an acute salpingitis, a ruptured gastric ulcer, a perforating wound of the intestine—all intraperitoneal infections are promptly manifested by tenderness, pain, nausea and vomiting, distention, rapid pulse, mounting temperature. On the other hand an infection behind the peritoneum, within the liver, or within the large abdominal veins occasions little or no nausea or vomiting, little or no tenderness, but little pain, and a comparatively slight change in pulse and temperature.

In the infections of the free peritoneum, the struggle is fierce, dramatic and boisterous; the decision is prompt. In a retroperitoneal infection the struggle is mild, the decision tardy. A subphrenic abscess is shy and concealed; an acute appendiceal abscess is bold and obvious. Contamination of the peritoneum progresses by bounds to infection; contamination of the retroperitoneal area progresses but slowly to infection.

In a general way it may be said that the defense of the tissues of the abdomen varies from almost 100 per cent in the mucosa of the intestine, where the defence is so perfect, that although it is constantly contaminated, the contamination rarely progresses to infection, to almost 0 per cent in the retroperitoneal area, where contamination slowly, but insidiously and progressively, goes on to infection.

Between these two extremes lies the peritoneum, contamination of which rapidly progresses to infection, but as rapidly calls into action the mechanism of defense.

The adequate defense of any tissue against infection demands (1) an adequate nerve supply; and (2) an abundant supply of blood.

(1) *Efficiency of the Defense of a Tissue in Relation to Its Nerve Supply.*—Not only is there an abundant supply of nerve endings in a well-defended area, but there appears to be also a qualitative difference between the nerves of well defended and of poorly defended regions. The nerves of the well defended regions act as chemical ceptors, carrying to the nerve centers and the brain stimuli from the presence of toxic agents, just as in their function as contact ceptors they convey the stimuli of physical contacts. The nerves of the poorly defended areas on the other hand, are not only few in number, but give comparatively tardy response to chemical stimulation.

(2) *Efficiency of the Defense of a Tissue in Relation to Its Blood Supply.*—Together with the abundant nerve supply of a well-protected tissue, we find an abundant supply of capillaries. The difference between the blood supply of a well defended and of a poorly defended tissue is dramatically displayed when an incision is made in each. An incision in the former, the intestinal wall, for example, is followed at once by a lively oozing of arterial blood from every part of the incision; an incision in retroperitoneal tissues, on the other hand, is followed by but slight bleeding. Even within the liver, the sluggish oozing which follows an incision is of dark venous, rather than of bright arterial blood. Well defended tissues, such as the walls of the intestines, are brightly colored by the rich supply of blood, while poorly defended tissues in general are pale rather than florid in appearance.

The important coexistence of the rich nerve supply in well defended regions with the rich blood supply lies in the fact that the production of the chemical factors in the defense against contamination and infection is initiated by the nerve receptors; their rapid transportation and their distribution in the area of danger depends upon the blood supply. The efficiency of defense depends alike upon the number and alertness of the sentinels and the mobilization and distribution of the forces.

The comprehension of these essential distinctions between the well defended and the poorly defended areas of the abdomen leads to the formulation of certain fundamental principles, the observance of which diminishes the hazard not only of surgical procedures actually within the comparatively defenseless areas, but also of the extension of contamination or infection from adjacent areas.

These fundamental principles may be stated briefly as (1) avoidance of contamination; (2) avoidance of anemia and promotion of blood supply; (3) the two stage operation.

(1) *Avoidance of Contamination.*—As has been stated above, in the defenseless areas, while contamination proceeds but slowly to infection, nevertheless, because of the lack of the local defense, the progress of events is practically inexorable.

One of the most poorly defended regions of the body is the subphrenic area, the narrow confined space between the dome of the liver and the diaphragm. It is vitally important, therefore in operations upon structures in that vicinity—upon the gall bladder or the liver in particular, that the entrance of fluids into that region be rigidly prevented. This is of as great importance as the prevention of the entrance of bacteria into the equally unprotected mediastinum. Drainage and Fowler's position avail little after contamination has once entered the subphrenic area as it is practically sealed from below. Moreover, there is little or no protective exudation from the subphrenic area to protect the organism from the absorption of septic fluids, in contrast to the abundant exudate which limits absorption of the septic products of intestinal or peritoneal infection.

In gall bladder operations, therefore, the best drainage is always dependent on drainage, so placed as to avoid any possibility of an accumulation of fluid that can be dispersed by the respiratory movements. In two-stage operations for acute cholecystitis, especial care should be exercised in surrounding the drainage tube inserted at the preliminary operation with a sufficient packing of iodoform gauze to prevent back seepage of the septic fluids.

In operations upon the large intestine, contamination of the lower retroperitoneal areas is prevented by the complete diversion of the fecal stream from the field of resection by means of a colostomy or visceral anastomosis.

In certain gynecologic conditions there is danger of invasion of the retroperitoneal space. Infection following a normal delivery may enter this undefended area, its presence there being unsuspected until attention is arrested by a systemic condition which suggests the unsuspected invasion.

In any acute abdominal infection, the danger of extension into the retroperitoneal area is lessened by strict avoidance of opening this space and the establishment of drainage at the lowest possible point.

(2) *Avoidance of Anemia and Promotion of Blood Supply.*—The blood supply of any tissue may be diminished or prevented by mechanical means, such as the application of clamps or ligatures; by devitalization of the part by trauma; by cold. It follows that the already lowered resistance of a poorly defended tissue may be reduced still more by the production of local anemia by any cause; by local injury; or by local cooling. These facts lead to obvious measures in the protection of the areas we are considering. Trauma of operation must be reduced to a minimum. In a reduced patient the transfusion of blood,

and if there is any myocardial weakness, augmentation of the heart action by digitalis will aid here as it does elsewhere. In any case in which invasion of the retroperitoneal space is threatened the local blood supply may be augmented by the application of moist hot packs, large enough to cover the entire region. This procedure will dilate the comparatively meager supply of capillaries and augment the circulation of arterial blood throughout the area and the heat itself will increase the chemical defense.

(3) *Two-Stage Operation.*—When a contemplated surgical operation involves the defenseless areas, such as operations on the large intestine, division of the operation into two stages promotes the conservation of the weak defenses in part by local reaction, in part by the promotion of the general welfare of the patient. This is an added argument in favor of the multiple stage operation in these cases.

Our widest experience in the untoward possibilities of invasion of the retroperitoneal space or of its direct injury was secured in the war, when penetrating abdominal wounds and direct invasion of the deep abdominal regions were daily encountered. These were the injuries which taxed the resources of the military surgeon to the utmost and the fight of the already depleted organism against the insidious progress of infection in these defenseless areas was almost more hopeless than the fighting in the trenches when the adverse odds were the greatest.

In that experience as in civilian surgery it became obvious that all the methods which conserve and increase the resistance of the patient as a whole were the best means whereby to promote the resistance of the poorly defended areas. Transfusion, maintenance of an adequate supply of water, sleep and rest, the two-stage operation, nitrous oxide analgesia, local anesthesia, minimum trauma, as well as the especial procedures mentioned above—posture, prevention of contamination, warmth—all aid in the protection of the poorly defended areas.

The application of these methods in the surgery of war made it practically possible to save every man whose wounds were not anatomically beyond repair, provided he reached the hospital before the final stages of exhaustion had been reached. In civilian surgery we have been able by these methods to reduce continuously the mortality and morbidity in the types of operations we have been considering.

In our last 393 operations upon the gall bladder and large intestine, the mortality rate has been 2.3 per cent. This number includes 114 operations on the large intestine, of which 43 were radical operations; in this series there have been three deaths.

DISCUSSION

DR. ROBERT T. MORRIS, New York City.—It would be interesting to know the relation of the trophic nerve supply to certain undefended areas, and I would like to have Dr. Crile apply his philosophy to one question, namely, the failure of

union of superficial tissues at a point below the xiphoid. Sometimes in operations upon the upper abdomen in the midline there is a failure of union, apparently where there is no infection. Not long ago I had a case in which there was complete failure of union; the incision opened and in speaking of it before the Surgical Society in New York I found two other surgeons had had similar cases. There were three cases in which there was failure of union below the xiphoid. My explanation is this: some time ago Ross and Sherrington showed that various organs have peripheral representation. Head classified the data and mapped out certain zones belonging to various organs. The Head zone for the gastric area is a line drawn between the navel and the interval between the ninth and tenth ribs on each side. It seems to me, in all probability that a very high midline incision and gastric operations would probably disturb not only the sensory nerves in this vicinity, which would make a response on the part of sympathetic, but incidentally the trophic nerves at the same time and fail to carry on defense and repair.

DR. GORDON K. DICKINSON, Jersey City, New Jersey.—I well recollect some years ago sitting of an evening and listening to old Dr. Senn talk. He did not tell how many jobs of a certain kind he had done. He did not spend the evening speaking about technic but spoke of the principles of surgery and that which made you think over your cases. I have yet to hear Dr. Crile come here and tell us how to do a thing, but he comes always and tells us about the man as a whole, the general principles of physiology and pathology, and you deduct your own conclusions to suit yourselves. I think that is one of the things which is absolutely essential if we as a profession are to hold our heads up high. Anybody can operate; any man can cut down on a growth or can carve and chisel out an angle, but very few men are sculptors. If we as a body are going to be well known and get repute, we must think more of things that are inspiring and less on those which are productive.

I remember a few years ago Dr. Miller asked me if there was a real good book on gynecology, and there was not one, but one has come out since, and that is Graves, because woman is the first thing mentioned in the chapter before he speaks of the diseases of women.

Some one said this morning that men were taking out tonsils and getting rich. I do not know of a single man who in removing tonsils looks for a thymus or studies the general condition of the patient to see if the case is purpuric. They are all groping in the dark. If we want to be what we would like to be, we must study nature in general and less of local tissue.

DR. CRILE, (closing).—My friend, Dr. Dickinson, was epigrammatic in his statements as usual. In regard to Dr. Morris' discussion, I should like to add that when we are able to chart the human organism as a whole we shall probably find that there is an extraordinary relationship between the richness of the nerve supply and blood supply, both of which are defensive mechanisms. There are certain veins which have no sensory nerves, and if we get an infection of one of those or of the meninges we have difficulty in achieving a successful result. Such patients usually die. In those cases in which the meninges are involved in operations upon the spinal cord, there is no sensation, yet, if infection develops the patient will have a bad time and generally dies. This is true also of the mediastinum, and of the endocardium. In those cases in which there is a hematoma in the deep muscles of the back with resultant infection on account of the low degree of defense, the case may go on for months. In operations upon the abdominal areas therefore it is a good thing to bear in mind that there are these enormous differences in the degree of protection of different areas with no defense whatever in certain parts.

SURGICAL STRATEGY AS AN ADJUNCT TO LOCAL ANESTHESIA IN ABDOMINAL SURGERY

By Robert Emmett Farr, M.D., Minneapolis, Minn.

GOING over the literature one is struck with the marked contrast in the reports of the different observers concerning intraperitoneal pain sense. I believe that much of the difference of opinion is due to the fact that the findings are far from constant in different individuals and vary even under similar conditions and greatly under a variety of conditions. The various forms of peritonitis and the general condition of the patient influences findings. It is generally taught that the parietal peritoneum is sensitive and that the viscera are devoid of pain sense in the absence of traction upon the mesentery. My observation shows that this is not entirely true. Traction upon the intestines even without traction upon the mesentery may cause pain; heat applied to the exposed intestine will produce cramps, which are described as gas pains.

I have had a young man of excellent poise and intelligence state that the introduction of the needle through the wall of his intestine was painful, and a careful test showed that he could feel the needle pass through his intestinal wall even though his eyes were covered and an effort made to deceive him. Traction upon the mesentery was here carefully excluded. The parietal peritoneum in the absence of inflammation is insensitive to light touch or even to scratching. However, pinching and traction are disagreeable. In disease this structure is sensitive even to light pressure. This is especially true of certain areas as, for instance, the culdesac. The results of observation will also vary with the manner in which experiments are made. A brisk, quick action will cause complaint when the same act stealthily performed may be readily tolerated. One observer states that the mesoappendix may be clamped without pain and backs up his opinion by observations upon a series of fifty cases, while another finds that this structure is always sensitive, especially in acute appendicitis. The facts are that the sharp application of a hemostat to the mesoappendix will elicit a complaint from the conscious patient who has not had preliminary medication, unless cocain has been used. (Some authors state that cocain acts as a general analgesic but I have had no experience with it.) However, if one slowly and carefully applies the clamps the patient may not remonstrate. Many factors must be considered in making this simple observation. Whereas, as a rule, the patient who is undergoing an operation under local anesthesia is ready to complain at the slightest opportunity, and may even complain when

not being hurt with the hope possibly of making the surgeon more cautious, we must not forget that he may have been compelled to suffer so much during the procedure of delivering the appendix that by comparison the clamping of the mesoappendix may not bring forth a complaint. In no other manner can an observation of this kind, which is so at variance with my own experience, be explained.

Thus, I have frequently found that a strong clamp may be placed upon the mesoappendix, provided it is forced down very slowly, with only slight complaint on the part of the patient. It is known that the base of the appendix may be clamped with no pain sense after the mesoappendix has been blocked or divided. The ovarian pedicle, the cystic duct, and even the fundus of the uterus are tender and cannot be attacked without causing pain, although the latter may be found to be almost insensitive in some cases. The large vessels in the mesentery are sensitive and even those in the omentum, if clamped close to their origin, may show pain sense. There is, therefore, an opportunity to perform operations upon most of the pelvic viscera when the above areas mentioned can be blocked before the operative procedure is begun. Pathologic conditions which cannot be handled without traction upon the mesentery, mesoappendix or posterior abdominal wall may not lend themselves to this form of anesthesia. Here, again, however, we have a good illustration of the difference between careful and rough handling of the tissues. A perfect exposure with a perfect negative pressure may and often does give one the opportunity to see the retaining bands which anchor the tissues to the posterior abdominal wall with the aid of only slight traction while the bands are cut with knife or scissors and the parts liberated. A good exposure will give one the opportunity of reinforcing the anesthesia. When the necessity for traction can be anticipated the tissues upon which the traction is to be made should be blocked at their points of origin from the abdominal wall. We have in a number of instances removed adherent pus tubes by following this plan. Masses which appear to be very adherent and resistant will be found to shell out easily at times after cutting the "key" bands under direct vision. The important point is to locate the lines of cleavage with as slight an amount of traction as possible and to clip the retaining bands as they appear.

Our experience does not coincide *in toto* with that of Professor Braun, and others, who believe that abdominal surgery can be carried out only upon individuals in whom complete relaxation of the abdominal wall is obtained, although this factor is of great importance.

One of the most surprising of our experiences was the realization of the extent to which abdominal explorations might be carried out under simple infiltration of the abdominal wall with its resultant relaxation of the parietes, combined with vertical retracting, negative

intraabdominal pressure and the utilization of the force of gravity which may be obtained by tilting the operating table.

For exploration of the upper abdomen, and operations in this region, we employ the reversed Trendelenburg position. The lateral aspects of the abdomen are best exposed by tilting to the right or left as the case may be. It is not uncommon when complete relaxation is obtained to find that the force of gravity carries all the small intestines into the lateral half of the abdomen. This gives one a most excellent opportunity to apply anterior splanchnic anesthesia in the mesentery or in the retroperitoneal space.

We have almost without exception carried out all of our intestinal resections, even those of the large bowel, under this technic. We would advocate tilting in the performance of surgery in the upper or lateral aspects of the abdomen and believe that it has as great advantages as has the Trendelenburg position, which is its analogue when doing pelvic surgery.

RETRACTION

In abdominal work good exposure is a *sine qua non* to success. It is to be hoped that the day of finger retraction is soon to pass. It is incompatible with asepsis and the desired result can be much more easily attained by the use of proper retractors which will take up less room and, as a rule do the work much more satisfactorily. Harsh retraction will produce much the same effect as inefficient anesthesia. I have known of instances in which an otherwise ideal local anesthesia was converted into a failure, and general anesthesia found necessary because a careless assistant allowed the abdominal wall to slip from a retractor, thus causing a contraction of the abdominal muscles and an expulsive effort, resulting in the extrusion of a large mass of intestinal coils. The most important point about retraction, when working under local anesthesia, is that it be steady; that is, continuous and not intermittent or jerky. "Stealthy" is the word which best describes the manner of doing our work most satisfactorily under local anesthesia. Retraction should be symmetrical, if possible; that is, equal on the opposite sides of the wound, especially if continued for a long time. Forceful retraction, if made slowly, carefully and methodically, is not usually objected to.

DIRECTION, SITE, AND CHOICE OF INCISIONS

While local anesthesia does not contraindicate the use of any particular incision its use demands an adequate exposure of the pathology present and when operating under its influence great advantages may be gained from a proper selection of the abdominal incision. In our experience the transverse or "L" incision has given the most excellent exposure when working in the upper abdomen and we have used it

almost exclusively since 1910. With proper equipment one may anesthetize and enlarge any abdominal incision at the rate of about one inch per minute. Therefore, we do not hesitate to enlarge our incision in any direction when unexpected pathology is encountered, or when other conditions arise which make this procedure seem advisable. The realization of the ease with which this may be done effectually eliminates the necessity for making the original infiltration far beyond the limits of the regular incision and meets criticism that other pathology cannot be reached.

When making abdominal incisions it is desirable in many instances to avoid pressure upon the underlying structures. Acute cases, nervous people or children demand that the abdominal wall be lifted while incising. The skin may be grasped with towel pins and after its division and the nicking of the fascia this structure may also be elevated. Likewise the peritoneum may be gently retracted and when opened the abdominal wall may be elevated by placing a retractor beneath its surface. This demands the careful anesthetization of the peritoneum to a point some distance away from the incision. We do not hesitate to reinforce the anesthesia by introducing the needle subperitoneally after the abdomen is opened for the purpose of injecting the solution.

MUSCULAR RELAXATION. THE PSYCHOANESTHETIST

While the abdomen is being opened much may be done to bring about the ideal condition of complete muscular relaxation which is so essential for successful intraabdominal surgery. An adjunct of vital importance is the "psychoanesthetist" who sits at the patient's head during the operation, looks after his comfort and records the blood pressure, pulse, and respiration. Tactful cooperation on the part of this individual will be found of great assistance. In addition to her other duties her efforts should be directed especially towards aiding in securing relaxation. This individual should be well trained in the administration of general anesthesia and, therefore, prepared to change to mixed anesthesia should this seem advisable.

Again I wish to state emphatically that complete muscular relaxation must always be the goal toward which we should strive if we are to attain the greatest success in this work. The tension which is always present when a patient winces and struggles under the manipulation of the surgeon prevents the complete abdominal relaxation so necessary for the proper performance of any abdominal operation. The surgeon must realize when attempting laparotomies under local anesthesia, that success can be obtained only by the use of a technic which permits of relaxation. The author contends that such relaxation may be obtained in most cases, and perhaps in all, provided one's technic is sufficiently good. For those who are not able to obtain this relaxation in a reasonable percentage of cases, abdominal surgery under

local anesthesia will continue to be a herculean task and as a consequence they will quite probably continue to condemn the method in the future as they have in the past. It is hoped that a more universal realization of the facts will change the attitude of that large percentage of surgeons who maintain that only certain classes of cases should be operated under local anesthesia and will convince them that almost all classes of cases can be operated upon successfully by this method and that this is being done daily by those who are accomplished in this art.

As a rule, when the abdomen of an apprehensive patient is uncovered upon the operating table, the tension under which he is laboring will be plainly manifest. The abdominal muscles, instead of being relaxed, will be tense and rigid and the normal depressions which show when a patient is at rest will be absent. This is most plainly seen when the Trendelenburg position is assumed. Here the relaxed individual will present a depression in both iliac fossae. The pubes and anterior superior spines will be prominent and the upper abdomen will bulge forward, as it will contain most of the viscera. In the tense patient this condition does not obtain. The recti are contracted and stand out as ridges on either side of the midline. Contraction of the lateral groups obliterates the depressions normally found below the navel and it is evident that the viscera have not gravitated to the more dependent portions of the abdomen. Now, unless this condition can be overcome by the introduction of the anesthetic with the aid of suggestions and instructions from the psychoanesthetist, who coaches the patient in regard to his manner of breathing and the avoidance of straining, grunting, coughing, or laughing, general anesthesia had better be administered before the peritoneum is finally opened. Few operations can be performed without complete anesthesia. Certainly under such conditions none can be performed painlessly, and a painful operation is neither fair to the patient nor to the method and should not be performed.

THE EXAMINATION OF THE ABDOMINAL ORGANS

The comparative ease with which the abdominal organs may be examined under conditions of complete relaxation, as contrasted with the difficulty encountered in making such an examination under the conditions usually seen when watching abdominal operations, may be brought out by the illustration of the inspection of a herd of live stock under varying conditions. Under ideal conditions we would open the barnyard gate and look over a herd of live stock eating peacefully within the enclosure. The condition of each would be noted, even though an occasional one might need to be turned around in order to obtain a better view. If, on the other hand, when the gate is opened the whole herd, or a goodly portion of it, rushes headlong into the gateway

and must be forcibly restrained the inspection cannot be detailed or satisfactory. This comparison, though a homely one, is nevertheless not greatly overdrawn.

The superiority of visual over digital examination I have discussed elsewhere and nowhere does it apply more aptly than in abdominal surgery. Though much valuable information may be gained by palpation, inspection is and will always remain the great purveyor of the facts concerning the actual conditions present. Unfortunately, there is a class of cases in which a negative intraabdominal pressure cannot be obtained, regardless of the form of anesthesia used, and here we must depend to a large extent upon other senses than that of sight. A discussion of the mode of procedure in case a proper exposition of the internal organs cannot be brought about might be worth while.

One has at his command immediate resort to general anesthesia, or the use of some form of surgical strategy, in order to meet the demands. During recent years we have not hesitated to allow more or less evisceration in order to obtain exposure in certain cases. For instance, in the performance of an intraabdominal rectopexy, combined with the removal of a fairly large subperitoneal uterine fibroma, in an individual who was afflicted with marked ptosis and a greatly deformed spine, we found all of the abdominal viscera present in the pelvis when the abdomen was opened. In this case there was practically no space in the upper abdomen for the viscera. Warm, moist sponges were laid upon the abdomen, the whole mass of intestines, stomach, and a portion of the liver were allowed to protrude without restraint. They were then carefully protected by moist, warm pads while the pelvic operations were completed. With ample incision and the avoidance of traction one may follow this procedure with considerable success. This strategy may also be necessitated by the inadvertent evisceration of the abdominal contents due to vomiting, sneezing, coughing, or laughing, or in children, by crying. In a certain percentage of cases of this variety we have met the emergency by the adoption of the above plan and avoided the necessity of giving general anesthesia.

VISCEROPARIETAL ADHESIONS

Visceroparietal adhesions are usually considered somewhat difficult to handle under the use of local anesthesia, and indeed are usually considered sufficient to contraindicate its use. Nothing could be further from the facts if we are to take our own experience as a criterion.

The adhesive bands themselves are without sensation, and provided the abdomen is opened without pain, with perfect relaxation under a negative intraabdominal pressure, and its wall lifted vertically as the peritoneum is opened the adhesions will be visualized exactly as at autopsy, and may be cut upon the "white line" where they join the parietal peritoneum. As traction upon the parietal peritoneum causes

pain the vertical retraction of the abdominal wall should be carefully graduated. The weight of the piece of intestine or other viscus which may be suspended from the abdominal wall may be sufficient to cause the patient discomfort. However, if one lifts the abdominal wall to a slight degree only the adhesions may be visualized and the anesthetic introduced into the properitoneal fat by introducing the needle through the abdominal wall or from the peritoneal side.

Viscerovisceral adhesions may be divided without the use of intraperitoneal anesthesia. The only requisite is the avoidance of traction upon the posterior parietal peritoneum, and even this structure tolerates sufficient traction to allow one to identify the retaining bands, which may then be divided with a knife or scissors.

In conclusion let me reiterate that exposure and the absence of expulsive effort are the prime essentials in meeting the surgical demands in this class of cases. The abolition of the abdominal reflexes, vertical retraction, tilting of the table, combined with a negative intraabdominal pressure, the cooperation of the patient which is best obtained by solicitous care of this individual from the time he presents himself for treatment, combined with the utilization of the skill and tact of a well trained psychoanesthetist will make it possible to perform with satisfaction a large percentage of abdominal surgery under local anesthesia.

Attention to these details, as above enumerated, we have chosen to designate surgical strategy.

2433 Bryant Avenue South.

DISCUSSION

DR. G. VAN AMBER BROWN, Detroit, Michigan.—About eight years ago I was much impressed with the work that can be done in the pelvis under local anesthesia. At that time I had referred to me a woman who by instrumentation sustained a puncture of the uterus at delivery. Following this she had for several weeks been bleeding at intervals, and when I saw her the blood was so impoverished that her tissues were generally edematous; her labia were like sacs of water; her face was bloated; her red blood cell count was 1,145,000; her hemoglobin was low—in fact, so low that it could not be estimated away from the bedside, at the bedside it was 20 per cent. We dared not give her a general anesthetic. She was placed in the Trendelenburg position, and to my great surprise we were able to do a hysterectomy, using novocain solution, one-half of one per cent. She left the hospital the nineteenth day after operation, with a blood count of about 3,000,000.

There is one more point I desire to call attention to. Some of you may have felt when you saw Dr. Farr inserting these large needles in the upper part of the thorax and neck, that there was great danger of puncturing the blood vessels. The large arteries have strong thick walls, the solution precedes the point of the needle and as it approaches these arteries they are not injured, but rolled out of the way. In the veins pressure is low and if the needle should puncture one, there is no danger providing that while you are making infiltration the needle is all the time on the move. The solution is going in as the needle advances, also as the needle is withdrawn, so that there is no danger of getting much of the anesthetic

solution into the vein. In other words, the danger of puncture of veins or arteries is negligible.

DR. ABRAHAM J. RONGY, New York City.—When I was in Paris during the month of August, I saw one of the leading surgeons there operate under regional anesthesia, and while he did not have the equipment and the appliances that Dr. Farr has at his command, still it was done well.

I think Dr. Farr must realize that a great many of the public institutions, semi-private or charitable, will not equip the operating rooms with the necessary paraphernalia and assistants, as suggested by Dr. Farr. Dr. Farr has been very fortunate in convincing the Board of Directors of his institutions to expend the necessary amount of money for the equipment.

Most of us know that it is very difficult to obtain funds from the governing bodies of these institutions for equipment, which they think is not part and parcel of the routine expenditures of the hospital.

DR. J. F. PERCY, San Diego, California.—There is one phase of the subject of local anesthesia as presented by Dr. Farr that may be of great practical importance in the surgery of cancer. If the observations of Gaylord and his associates some years ago are correct, the administration of either ether or chloroform lowers the natural resistance to this disease that undoubtedly exists in these patients. I have been greatly impressed with the work of Gaylord, so much so that I am never altogether happy when I give a general anesthetic to any patient suffering from cancer. Gaylord in a personal communication told me further that his experimental work in this regard had not included the gas oxygen anesthesia, but from the theoretical view point it should be the least harmful of any of the general anesthetics. The local anesthetic technic so beautifully and so thoroughly described here today would almost certainly eliminate the dangers pointed out by Gaylord as being true of the two general anesthetics most frequently used. The only objection to this local method that I can imagine is the one of stimulating the growth to increased activity should the infiltrating needle unhappily invade a focus of malignant cells.

Contrary to the usual assumption the cautery knife technic does not require a complete anesthesia, and I am not now assuming that the infiltration of a procain solution does not or cannot be made to produce a complete anesthetic effect. The facts are that the cautery is the least painful method of severing the tissues. This is something that surgeons have yet to learn, and also that the after effects of the use of the cautery, as far as pain is concerned, cause less suffering than is ever true following the use of the cold knife. The most comfortable surgical patients I have are those who have had an extensive cautery dissection of the breast and axilla. One of my devices is to take the hand of one of these patients the next morning following her operation and shake it rather vigorously. For a moment they are startled, but immediately they laugh. The practical reason for doing this is to teach the patient that she need not hold herself rigidly but can at once begin to use her arm as if there had been no operation. This stimulates an early return of function and it also aids in a more rapid development of the tissues necessary in the repair of the parts. The explanation of the freedom from pain is that my cautery knife puts what may be described as a leather cap on the end of every nerve I sever with it, so that conduction of the pain sense is absolutely inhibited. And so I repeat, local anesthesia by the methods of Dr. Farr may have a very great future in the surgery of cancer, and I hope to be able to develop it.

DR. ROLAND E. SKEEL, Los Angeles, California.—The matter of local anesthesia we have not developed to such a state of perfection as has Dr. Farr, but at the time of the above mentioned agitation which arose in the middle west regarding

anesthetics, some of us were using a combination of local and general anesthesia, in a manner that any of us can carry out. Many patients who are not fit subjects for exploration under general anesthesia can easily stand an exploration under local, to be followed by nitrous oxide or ether if painful manipulations are required to complete the operation.

One should be skillful in the use of this preliminary local anesthesia and cause as little pain as possible, but when such a stage of the operation is reached that pain is inevitable, the patient takes his inhalation anesthetic without resistance, and if ether is being used, the operation is often completed by the time deep surgical anesthesia is induced.

If we have the two prime requisites, pure nitrous oxide and a skillful nitrous oxide anesthetist, then nitrous oxide is the inhalation anesthetic preferred, since the preliminary local infiltration overcomes muscular rigidity, which is the chief objection to the use of nitrous oxide in abdominal operations.

In the absence of a perfectly reliable nitrous oxide, and an equally reliable administrator, nitrous oxide is dangerous and ether is to be preferred.

DR. FARR (closing).—I might say that an apparatus for this kind of work can be, and I hope will be, devised if there is a demand for it, and if the doctors demand it in hospitals, I believe boards of directors will come across. We do not have any trouble of that kind; if we did, I would not get very far with the boards of directors of hospitals.

I am not wedded to local anesthesia; I am trying it out and telling you what I have done with this method at the present time. I may change my mind in three months. Crile's scheme may be a better one, but until many men have done what I have done, I do not believe we can know. The only way to get that experience is to do what Dr. Skeel has recommended. If we adopt the other method of bringing the patient to an unconscious state we never get anywhere.

DOUBLE SALPINGOOOPHORECTOMY WITH PARTIAL AUTO-OVARIAN TRANSPLANTATION, FOLLOWED BY TWELVE YEARS OF MENSTRUATION, A NORMAL PREGNANCY AND AN UNCOMPLICATED MENOPAUSE AT FIFTY-ONE YEARS OF AGE

By William Seaman Bainbridge, Sc.D., M.D., C.M., New York City

CASE REPORT

C. S., thirty-nine years of age; married. January, 1905, I first saw this patient in consultation with Dr. W. T. Scovil of Richmond Hill, New York, to whom I am indebted for the postoperative history of the case. At that time the patient was suffering from double salpingooophoritis, old pelvic abscesses and peritoneal adhesions, the result of two miscarriages.

Operation was advised and performed January 10, 1905. The operative findings confirmed the clinical diagnosis. Extensive adhesions matted together practically the entire pelvic viscera. Ovaries and tubes formed part of an inflammatory mass which consisted largely of multiple tuboovarian abscesses. In removing this mass a complete ablation of the tubes and ovaries was necessary. The patient, with great desire for a subsequent pregnancy, had exacted a promise from the surgeon before operation to conserve in every possible way the ovarian tissue, even if some risk proved necessary. This phase of the matter was stressed by both the patient and her husband.

After the tubes and ovaries were excised, in the mass of pus was located a small piece of ovary, about half the size of the terminal phalanx of the little finger. This piece was carefully removed, grafted at the stump of the tube, in the cornu of the uterus and covered with an omental flap. The abdominal incision was closed, except for a small tube drain, at the lower part of the wound. This was dispensed with in a week.

Convalescence was uneventful. Four months later the patient had a regular menstruation and one and a half years subsequent to the operation had a normal labor and bore a healthy child. A year later the husband died. The postmenstrual life, after being reestablished, was quite regular and normal. At fifty-one years of age menopause occurred, uncomplicated by any distressing mental or physical symptoms and the mother and child are living and well today.

Since the completion of this case history, an article on ovarian transplantation, by Dr. W. E. Estes, has appeared in the *Medical Times* of May, 1922. The author of the article reports a pregnancy six years ago following the removal of the ovaries and the reimplantation of a part of the ovarian stroma, directly at the inner opening of the fallopian tube, in the horn of the uterus. The site of the graft and the technic of the operation, as described by Dr. Estes, are practically those used by the writer of the present paper in numbers of cases during sixteen years of ovarian transplantation when the tubes were removed.

34 Gramercy Park.

DISCUSSION

DR. STEPHEN E. TRACY, PHILADELPHIA, PA.—I would like to ask Dr. Bainbridge, how soon after the abortion the operation was performed? In patients in whom there has been an infection following an abortion, it has been our custom to avoid operation for several months. If the infection has not entirely died out, operation may light it up with serious results.

I would like to know also if the ovary was entirely separated from its former attachments? In other words, was the blood supply entirely cut off before the ovary was transplanted? We frequently suture an ovary to the cornu of the uterus when both tubes have been removed, but we try to preserve its blood supply.

Several years ago I assisted at an operation for acute gonorrheal infection of the pelvic organs. The surgeon intended to remove both appendages, but in ligating the right side a small piece of ovary was included in the ligature and allowed to remain. The pelvis was drained through the lower end of the incision. Two or three years later the surgeon was advised that the patient had married, had conceived promptly and had given birth to a healthy child.

DR. W. WAYNE BABCOCK, PHILADELPHIA, PA.—I wish to report two cases in this connection; one a young woman did not desire any future pregnancy. Both ovaries were resected freely and she was told that she would not become pregnant. However, she became pregnant the following year, and bore a living and healthy child.

The other case was a young woman who had extensive inflammatory disease in which we thought it was impossible to save anything except the uterus. The adhesions were exceedingly extensive, and we removed both tubes and ovaries as we thought, but two years later the patient became pregnant. How she became pregnant we do not know. Despite our care in trying to do a complete operation we had left in a piece of the ovary and did not know it. That seems to be a rather difficult thing to tell in some of these cases of ovarian transplantation. Maybe Dr. Bainbridge can tell us how he knew none of the ovarian tissue was left at the normal site or left in the adhesions in the region of the normal site.

DR. TRACY.—May I ask Dr. Bainbridge what material he used for his ligatures?

DR. JAMES N. WEST, NEW YORK CITY.—I would like to ask Dr. Bainbridge regarding the patient's labor, if he had attended the patient in labor, or if he has any history of the labor? The reason I ask this question is because it is an extraordinary case, and one should look at it from every point of view.

I was a witness in a unique case in which a woman was accused of the crime which is technically known as "forcing a spurious heir." This woman went into a house where confinement cases are taken; went to bed, had a placenta, and a baby brought from the next room. A doctor looked at the placenta and baby, and gave a birth certificate. I had examined this woman two months before for menorrhagia. The uterus was not more than normal size; she had excessive periods. She was supposed to have had a full term healthy child, and it became quite a noted medicolegal case in that it was necessary to have a trial of such a kind that there would be opportunity for a doctor to testify without violating the law in regard to privileged testimony. It took the form of an action instituted by the Board of Health to change the name of the baby. In that way testimony could be given which in a regular trial could not. The case was tried before the Corporation Counsel of New York. The woman fled after my testimony and never was arrested, and the supposed father was released from legal responsibility as the heir was proved spurious. The woman's case broke down toward the end and she confessed she had done this very thing. Many cases have occurred where women have pro-

duced spurious heirs to palm off on their husbands. I would therefore like to know something about the labor in the case reported by Dr. Bainbridge.

DR. BAINBRIDGE (closing).—In answer to Dr. Tracy's question, the patient came under my care some weeks after her miscarriage. She was treated expectantly for some time prior to operation, rest in bed, topical applications, etc.

In reference to the question as to whether or not some ovarian tissue may have been left *in situ,* this was impossible. When the masses had been excised, there was nothing left but the uterus,—the tubes, ovaries and even most of the ligaments had been removed.

Regarding the ligature material, I used simple, fine catgut to attach the stroma *in situ,* with fine, black linen for the peritoneum.

Dr. Babcock spoke about the completeness of the operation. I think there is no question but that these masses on both sides left the uterus practically without very much support.

In response to Dr. West's question, there was no uncertainty as to the paternity of the child. The family physician who was the accoucheur in this instance, assured me there was no doubt.

TRANSPLANTATION OF HUMAN OVARIES: PRESENT STATUS AND FUTURE POSSIBILITIES

By William Seaman Bainbridge, Sc.D., M.D., C.M., New York, N. Y.

In 1894 Knauer[1] made the first attempt to transplant ovaries in animals and proved that if ovaries were removed and implanted at another site in the same animal, atrophy of the uterus would not take place. Later, Grigorieff[2] repeated the experiments of Knauer and confirmed his findings—that ovaries excised and reimplanted in continuity with the tubes, in the same animal, would live and form ova and that a pregnancy could be produced. Ribbert[3] made experiments with guinea pigs and found that 30 days after the grafts were implanted, the essential parts of the ovaries were well preserved and in a state of proliferation. After 150 days these ovaries showed no atrophy—only normal ovarian development. Transplantations from one animal to another were less successful. Foa[4] made many observations in transplantations with rabbits and found that the ovaries of newly born rabbits live, and functionate much more rapidly than those of full grown rabbits. The ovaries of newly born animals, when transplanted into fully grown ones, very soon assume the characteristics of the mature ovary, but retain their juvenile characteristics when transplanted into young animals.

Very soon after these experiments on animals, Frank Cramer,[5] Tuffier,[6] Morris[7] and the writer did their transplantations in the human subject. Tuffier has performed more than 300 transplantations of ovarian tissue and his records show no mortalities. During the war and early postwar period it was my privilege in Paris to observe Tuffier's work along this line and he kindly furnished me with some of his unpublished data which, with his permission, I have freely quoted in this paper.

There was a period when the excision of the ovary was the rule rather than the exception and a cystic ovary was a surgically doomed ovary, but the pendulum has swung in the opposite direction and today the trend of surgery is towards saving the ovary whenever feasible. Where simple ovarian cysts are found and some glandular tissue still remains, complete ablation of the organ is no longer considered the only "safe" operative procedure. Improved technic has made possible the excision of the cyst, careful suture and plastic work on the ovary, with the result that many a woman has been saved from mental and physical handicap and perhaps life-long regret because of the conservation of this important factor in the cycle

of internal secretion. Happily, the ovary instead of having to prove its right to remain seems now in a position to demand of the surgeon the reason for its removal. Of course, to leave an ovary where extensive adhesions or large varicose veins probably will cause disease later, or where it will be interfered with by attachment to other organs, so situated as to render repeated traumatism and even degeneration likely, is a questionable procedure. On the other hand, when we fully realize the mental and physical upheavals consequent upon the sudden removal of the ovarian secretion from the body, we need to weigh well in each case the advisability of complete ovariectomy. It is true that the transplantation of ovaries, though still in the experimental stage, is attended with considerable success, yet there should be no complete ablation of this significant link in the internal secretory chain without an attempt to substitute ovarian nutrition.

Primarily, transplantation is employed for restoration of fertility after the removal of the ovaries, or to relieve distressing symptoms of artificial menopause following panhysterectomy. It has been repeatedly shown that, where the uterus is intact, the transplantation of an ovary or piece of ovary after castration will maintain, for a time at least, the function of menstruation. Tuffier always transplants ovaries in women under 40, where for conditions, other than malignant ones, he has performed a complete or partial hysterectomy. In one of his cases which I observed at his clinic in Paris recently, he removed the left ovary and both tubes because of a bad pus condition. The right ovary, which was normal, was also removed and inserted in an extraperitoneal pocket which was made under the rectus muscle. Tuffier explained "that when one ovary and the tubes were removed for a pus condition, adhesions frequently formed about the ovary which was left and the result was much pain and discomfort. He believed it more satisfactory to transplant the normal ovary. He had had more than 300 such cases and found that these women experienced regular menstruation for four or five years following transplantation and the menopause then occurred naturally and without serious symptoms. The first menstrual period after the operation was delayed for a time but the only disagreeable symptoms experienced by the patient were a slight tenderness and swelling at the site of the abdominal graft and even these minor discomforts vanished at the first postoperative menstruation." Such an eminent authority as Biedl[8] says "that the experiments of several well-known scientists have shown that the presence of even a portion of one ovary in any part of the body is sufficient to maintain the complete anatomical integrity and functional activity of the genital organs." However, I have been unable to find any case, in medical literature,

where the grafting of ovaries has succeeded in reestablishing menstruation after the normal menopause.

In transplanting human ovaries various sites are selected, but for therapeutic effect alone the usual site is the abdominal wall in the region of the rectus muscle, partly because the blood supply here is favorable for the graft and partly because the graft is more accessible should the grafted tissue become cystic. Tuffier has transplanted more than 200 grafts in the abdominal wall, outside the peritoneum, or in the subcutaneous tissue. In three cases he also grafted ovarian tissue in the posterior part of the mammary gland, his object being to discover a favorable anatomical ground which would supply permanent vitality to the graft.

In my own cases where autogenous,* homogenous or heterogenous transplantation is for therapeutic reasons, I make a pocket behind the rectus muscle, insert the graft and anchor it in place lying on the deep epigastric artery and veins, in close proximity to lymphatic radicals—where it will not be likely to suffer traumatism.

When the graft follows the removal of diseased ovaries (in nonmalignant cases, with the uterus intact), for the purpose of fertilization, I remove the ovarian tissue from the mass and, when surrounded by septic material, employ the cautery or electric scalpel, afterwards excising the nearby tissue which may have become devitalized from the heat. I then slit open the fallopian tube, insert and bring into close relationship the graft, stitch a peritoneal or an omental flap or fold over the ovarian tissue and fasten it to the uterus or broad ligament. When the transplantation follows the removal of both ovaries and fallopian tubes, I graft the ovarian tissue to the stump of one of the tubes, or if there is enough normal ovarian tissue available, to the stumps of both tubes.

In one instance, where I followed the autogenous implantation, after complete ablation of the ovaries and tubes for double salpingo-oöphoritis, with pelvic abscess, the patient had twelve years of menstruation, a normal pregnancy and an uncomplicated menopause at fifty-one years of age. A detailed history of the case is reported at this annual meeting of the American Association of Obstetricians, Gynecologists and Abdominal Surgeons.[13]

Another example is one in which, after panhysterectomy for multiple fibroids, including one tumor as large as a grapefruit, I closed the peritoneum, made a pocket externally within the aponeurosis—extraperitoneally and behind the outer edge of the rectus muscle—placed the raw surface of the ovarian capsule against the deep epi-

*Where the writer has used autogenous, hemogenous or heterogenous in this paper, the terms are intended to be defined as follows: *Autogenous:* An implantation of self-produced tissue. *Homogenous*: A transplantation of tissue where the recipient and donor are genetically related. *Heterogenous*: A transplantation of tissue between recipient and donor where there is no blood relationship. *Heterologous*: A transplantation of tissue between a human being and an animal.

gastric artery and veins and closed the aponeurosis, leaving the autogenous graft in this position. The patient who was at the menopause at the time of operation and showed distressing symptoms of the climacteric, reports that during the year since the transplantation she has had 100 per cent more vitality and is no longer troubled with palpitation or hot flashes. Indeed, so striking is the change in her condition that she, as well as her relatives, comment on it. Psychologic effect has had nothing whatever to do with the improvement, as the patient was not told of the transplantation until recently. She was merely requested to watch for and report on any tenderness at the site of the graft, which might occur coincident with the time of her preoperative menstrual periods. This case would seem to prove that the ovary in its new site had gone on functioning—giving forth its internal secretion and stabilizing the entire organism. This has been borne out in many other of my cases.

It is interesting to note that after the transplantation of an ovary for the purpose of fertilization, the graft, at first, apparently lives in its new surroundings by inhibition; it is not until vascularization is reestablished that the ovary is able to resume its ovulation. Tuffier says that the date of the first appearance of menstruation after the transplantation is of much importance, since he believes that if menstruation appears sooner than four months after the new graft is implanted, the flow is due to a piece of the original ovary which was not excised—and not to the new graft. My experience has been that in a number of cases, where there could be absolutely no doubt of the total excision of the ovaries—followed by autogenous ovarian graft—a normal menstruation occurred within three months of operation, one in six weeks.

There is considerable question as to whether the heterogenous graft is ever as successful as either the autogenous or the homogenous. Of course, both the homogenous and heterogenous grafts are apt to suffer loss of vitality by preservation in physiologic salt solution between the two operations and many writers claim that ovaries preserved in cold storage are quickly reabsorbed. For successful transplantation between patients, the chief requisite seems to be simultaneous operation. The lack of success with the heterogenous transplantations very naturally leads one to the question of whether grafting according to the donor law might not be advantageous in tissue transplantation as in skin grafting. During the war Crile demonstrated that skin grafting seems to take along blood law lines. In a report which I made to the United States Government in 1919,[9] I suggested that if the donor law is to apply to the transplanting of skin, then when transplanting any tissue we should conform to the same law. It may be that this will make possible greater success in transplanting

such glands as the ovary and the thyroid. Investigation may prove that more favorable results are obtained in tissue transplantation not only when the graft conforms to the donor law but when it is in direct continuity with the veins and arteries as well. Direct vascular continuity in the transplantation of thyroid and ovarian tissue seems to offer a difficult but a promising field for future research.

Tuffier says there are two phases of transplantation, which have no influence on the therapeutic value of ovarian grafts—the *nature* of the disease which necessitated the removal of the ovaries and the *duration* of the disease. Among his patients, where excision of the ovaries was necessary and later ovarian grafting performed, were over one hundred suffering from salpingitis, some of these with suppuration at the time of operation, and many cases of multiple fibroids, extra-uterine pregnancies and a number of pathologic conditions—other than malignant ones. While the nature and duration of the disease exerted no influence on the grafts, the age of the patient, on the other hand had considerable effect on the therapeutic results. Foa demonstrated this point very clearly in his experiments with rabbits.

The ovaries bear an important relation to the normality of the individual[12] and an acute surgical menopause—the sudden ablation of the ovaries in women before the climacteric—is a much greater strain on the balance of the individual than the gradual withdrawal of this potent secretion by the natural senescence of the menses. There has long been an effort to obtain a drug to alleviate the morbidity of this period and the results of the ovarian extracts and their derivatives vary according to the viewpoint of the particular writer. In many cases of hypothyroidism, thyroid extract has proved of great benefit. Both Hertoghe[10] and the writer have obtained highly successful results with thyroid medication and there are many authors who claim that equally favorable returns may be secured with the ovarian extracts, especially corpus luteum. But in thyroid therapy, above and beyond the temporary results obtained by thyroid medication is the greater work accomplished by thyroid transplantation. In instances where the gland was transplanted from an animal to a human being or from a human to a cretin, and lived, the graft, after a time, degenerated or disappeared by atrophy, but in numbers of cases, as reported in an earlier paper,[11] there was marked improvement in the individual for a time after the engrafting of the thyroid. *Transplantation* of either ovarian or thyroid glands has secured results beyond the point experienced by the use of glandular therapy. In this relation Biedl says: "The medical method is in reality a substitute for the surgical and is a less perfect and less certain imitation of natural measures. Where the extract is employed, only that proportion of the active substance which is, for the time being,

in the tissues and this is doubtless very small, becomes absorbed—while after transplantation the increase is incalculable because there is constant production."

From careful observation in numbers of ovarian transplantations and from the written experiences of others in this field, the writer has drawn the following conclusions:

(1) That the ovarian secretion is stimulant and tonic and that the sudden ablation of the ovaries in a woman before she has reached the menopause, without the substitution of an ovarian nutrient, may cause very distressing mental and physical symptoms.

(2) That the transplantation of ovarian tissue, either autogenous or homogenous, has proved successful for both therapeutic and fertilization purposes in human beings as well as animals.

(3) That for purely therapeutic uses an implantation may be effective at any one of several sites but behind the rectus muscle, where the graft will be removed from points likely to suffer traumatism, but in close proximity to the vascular and lymphatic systems seems the most satisfactory site.

(4) That for purposes of fertilization, where the ovaries have been removed and the uterus is intact, in a woman of child-bearing age, a normal piece of ovarian tissue grafted in continuity with the fallopian tubes, or at the stump of a tube, if the tubes have been excised, may live, form follicles and ova and a pregnancy be produced from the transplanted ovary.

(5) That in the transplantation of ovarian tissue, the closer the relationship of the donor and recipient the better, though such relationship is not necessary for purely *therapeutic* purposes.

In presenting this paper the writer realizes that the whole subject of endocrinology, both in its medical and surgical aspects is still in its infancy and that there is great danger of exaggeration and overstatement in tabulating conclusions, as is true in any new line of endeavor. However, the results so far obtained are sufficiently encouraging to warrant a firm belief that there is much of real benefit for humanity in this field of research.

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34 Gramercy Park.

DISCUSSION

DR. CHARLES G. HEYD, New York City.—We had occasion at the Postgraduate to graft skin for a complete avulsion of the scalp. We used seventeen different skin donors and were quite surprised to find that the transplants from certain donors uniformly failed. In studying the factors of failure we came to the conclusion that all transplants, in a measure, followed the law of blood donors; that is, you would not obtain successful grafts of skin or of like tissue if there was a wide difference in the serologic reactions of donor and recipient. It is a peculiar biotic law that you must have serologic affinity to have successful transplants. That would seem to suggest a possible extension of the serologic law in its relation to sterility. It would be interesting to test out the wife and husband in relation to their blood group, and I think that in the future we will see an extension of the donor law—a similarity in serologic reaction as the basis of all successful transplants.

DR. ROBERT T. MORRIS, New York City.—The most important point brought out in Dr. Bainbridge's paper is the emphasis laid upon the donor law. By that rule we are going to find a way out of our unsuccessful grafting.

In regard to serologic affinity, I made a series of rabbits immune to each other's serum, and after having done that, I transplanted the ovaries and found that the grafts became absorbed even more quickly than before.

In regard to saving homoplastic grafts, replacing an ovary which has been removed, it is important to conserve the fallopian tubes as well. The oviduct in many cases, particularly in infective cases, ragged, torn, clubbed, with no opening, appears to be such a pathologic mess merely from the gross signs, that many surgeons have removed everything *en masse*. If you spare the ragged, torn, bleeding, clubbed oviduct, with no opening, split it from the cornu of the uterus to the clubbed tip, drop it back into the abdomen, wait three months, open again, you will often find fimbriae which were not present before. You will find furthermore that part of the oviduct, which was obstructed by hyperplastic connective tissue, will be lined with new conducting cells, and the oviduct may have assumed nearly normal form. That is a point that has been overlooked, and if we spare the oviducts in many cases in which an ovary and tube have been removed, and if, at the same time, we make heteroplastic or homoplastic ovarian grafts, we shall then not only retain the effect of the internal secretion from the graft, but also an increased opportunity for pregnancy. The only pregnancy I have had in a number of heteroplastic and hemoplastic graft cases happened after a heteroplastic graft in which the two individuals happened to be alike by donor law. The mother bore two children. That was the only pregnancy obtained in my series of experiments. It is not the pregnancy part that is so important, as the avoidance of sudden menopause and retention of endocrine power.

DR. JAMES E. DAVIS, Detroit, Michigan.—In addition to the homoplastic and heteroplastic phase of the question, we have to bear in mind that the ovary is a deciduous organ. The age of the ovarian tissue ought to be considered and of course the age of the patient. Then there is the law of ultimate differentiation of tissue in the body, and the mixing up of connective tissue with epithelial elements in inflammatory and neoplastic changes would make it necessary for the expenditure of considerable tissue energy to restore the normal orderly arrangement. That I believe would interfere with successful growth.

It would appear that much more attention should be given to all tissue cultural conditions. If one may judge from the literature, this work has been done by simply placing a piece of ovarian tissue in a selected site where the blood supply can be

expected to be good and become properly established. I am satisfied that is much more necessary to the ultimate success of this work.

DR. BAINBRIDGE (closing).—In my *Report on the Medical and Surgical Developments of the War* (U. S. Naval Medical Bulletin, January 1919), I referred to work along this line done at Rouen during the war, where they had great success. Realizing the possibilities, I made this note in the Report: "If the donor law is to apply to the transplanting of skin, then when transplanting any tissue we should conform to the same law. It may be that this will make possible the successful transplanting of glands, like the ovary and thyroid."

While I believe the value of transplantation is very great, there is distinct danger that the exaggerated claims of the irregular practitioner, made public, will do harm in more ways than one. This must not deter us from a continuance of careful study and earnest investigation of the subject.

REPORT OF A CASE OF GENITAL ABNORMALITY AND ACUTE APPENDICITIS IN A GIRL OF EIGHT

By H. Wellington Yates, M.D., Detroit, Michigan

On March 31, 1921, through the courtesy of Dr. S. R. Ashe of Detroit, I was asked to see Mildred K., a girl of eight years of age, who had been ill for forty-eight hours with an acute pain in her abdomen, at first not well localized, but during the course of the next forty-eight hours, there were definite signs of an acute appendicitis.

This patient was the third child born of a healthy mother whose labor was attended without incident. Three children have since been born to the same mother and all are healthy and well.

The patient's infancy and early childhood were free of disease except measles at four years of age, she was fat and well nourished until that time, after which she has been very thin and apparently poorly nourished. While she eats very heartily of anything served, frequently demanding food between meals, she remains physically below par. Her bowels are regular and she has no digestive disturbances. While she urinates every half hour night and day, the urine is negative. She always has a dysuria and has to wait a considerable time before urination takes place.

Her mental capacity is that of a normal child of her age. While at home, she prefers to sit at the window and watch other children at play rather than to take any active part in childish games.

The patient was transferred to the William Booth Memorial Hospital where operation was immediately done. An incision was made over McBurney's point. When the peritoneum was incised, a considerable amount of seropurulent discharge was liberated. With the index finger in the cavity, the appendix was easily found; brought into the wound and dealt with in the usual manner.

With the examining finger one could detect a partial walling off from the area below, making it inadvisable to do any further exploration in the pelvic cavity to determine the normalcy of its contents. Accordingly a drainage tube was inserted in the lower angle of the wound and the incision closed from above downward. The drainage tube was removed on the sixth day. She made an uneventful recovery after the first two days of stormy convalescence and was discharged on the eleventh day with the wound completely closed.

Incident to these examinations her urogenital deformities were observed. The following anomalies were in evidence:

1. The umbilicus appears about nine cm. below its normal location. (Fig. 1.)

2. There was a diastasis of the recti muscles extending from a line drawn transversely from the anterior spines of the ilium downward for 7.5 cm. and separated at its widest portion 4.5 cm.

3. There is an apparent exstrophy of the bladder, through this

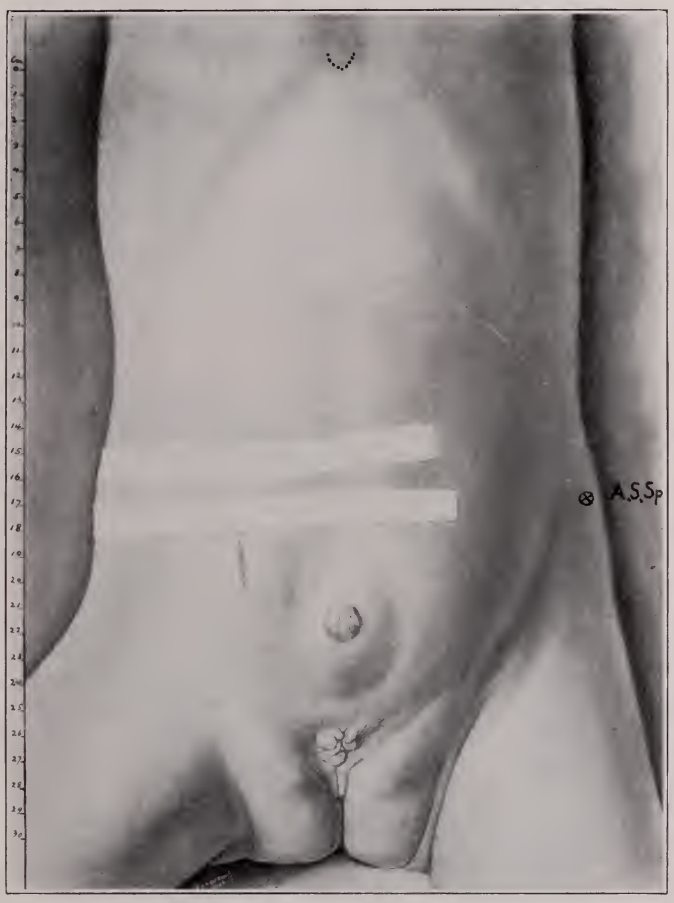

Fig. 1.

diastasis up to and immediately beneath the integument. It is in the center of this apparently exstrophied part that the umbilicus is seen.

4. We were unable to feel any union of the pubic bones—the ramus of each side apparently dipping down without fusion.

5. The external genitals are seen in irregular and undefined folds, the clitoris alone appearing most normal. The urethral meatus is very small, scarcely admitting a uterine probe, the nymphae were so immature that they could only be distinguished with difficulty and

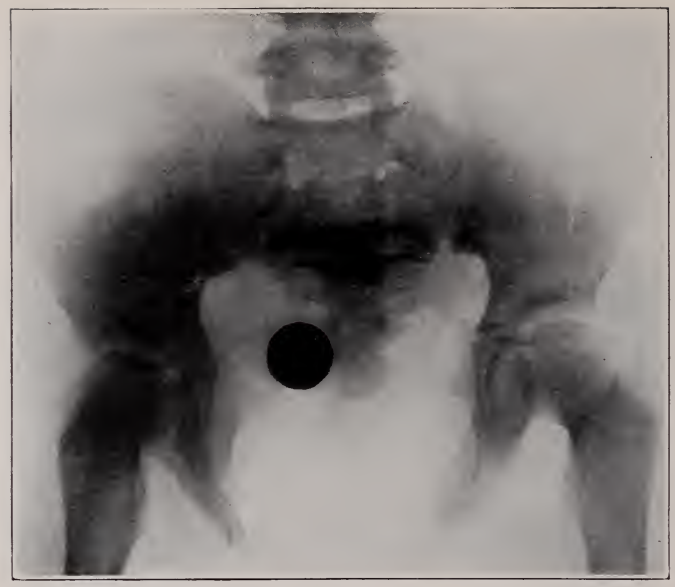

Fig. 2.

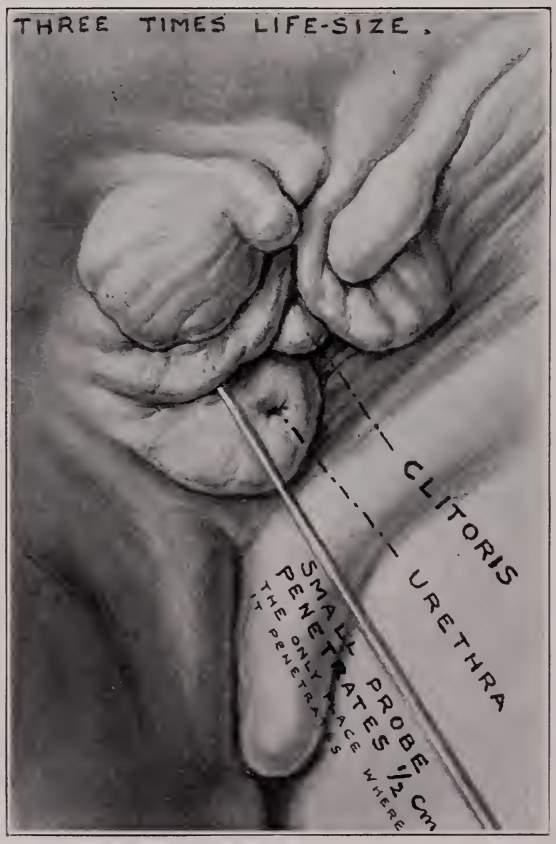
THREE TIMES LIFE-SIZE.
CLITORIS
URETHRA
SMALL PROBE
PENETRATES 1/2 CM
THE ONLY PLACE WHERE
IT PENETRATES

Fig. 3.

in no sense were a guide to the stream while urinating, so that during urination the urine was thrown upward toward the abdomen.

6. The vagina was entirely wanting, unless perchance it could be marked by a slight aperture which admitted the smallest probe for about one-half cm. Repeated attempts were made to carry the probe farther in without success. (Fig. 3.)

The x-ray examination (by Dr. G. C. Chene) made Sept. 15, 1922, showed an arrest of development of the pubis and ischium on each side. This is a condition seen in extroversion of the bladder. The anterior part of the pelvic girdle is deficient, the pubic bones being separated by about three inches. The pubic bones and ischii are directed forward instead of toward the mid-line and the obturator foramina are small and face laterally. The iliac bones appear flatter than usual and face more forward. The pubis and ischium have united properly on their respective sides. (Fig. 2.)

Recalling for the moment the early developmental phenomena connected with the genital system, we find the development of the wolffian bodies at about the end of the fourth week of embryonic life. Just inside of these bodies the elements of the genital glands which in the future become the ovaries of the female are seen about the sixth week. Coincidentally with the development of the genital glands there are seen two ducts which extend to the urogenital sinus; these are the müllerian ducts, from which is developed the entire genital tract to the vaginal introitus.

The müllerian ducts are at first solid and when they extend to the urogenital sinus they are unfused structures. When the development proceeds normally they run close together in their lower half and finally become merged into one structure, the upper part of this structure becomes the future uterus and its extension and fusion in collaboration with the urogenital sinus forms the vagina. These latter changes occur about the ninth and tenth weeks. When these tubes fail to reach the urogenital sinus the vagina ends blindly above the vestibule; or when their lower segments are stunted, the vagina and often the uterus may be entirely wanting. Congenital malformations of the vagina such as absent or rudimentary vaginae are usually associated with corresponding errors in the development of the uterus. While other malformations due to faulty union of the müllerian ducts occur, the more common is the uterus bicornis or a double uterus and vagina; the latter are not incompatible with pregnancy, labor and the puerperium, often occurring without unusual incident; this phenomenon is often not recognized since no external evidence is seen. Conception may occur on either side. We have observed one case of abortion about the sixth week which had a complete vaginal septum and a double uterus, excepting that the latter also had a septum between two otherwise normal uterine cavities.

Complete vaginal absence is seldom found in any but nonviable monstrosities according to Anspach, but the case reported rather refutes this statement. Marked vaginal atresia may be the result of a vaginitis of gonorrheal origin, but complete congenital atresia is associated with anomalies in the development of the müllerian ducts and under those circumstances is always associated with abnormalities of the uterus and adnexa of one side. A true atresia of the vagina must be differentiated from the inflammatory type which is but the result of some acute infective agent.

David Whitney Building.

DISCUSSION

DR. G. VAN AMBER BROWN, Detroit, Michigan.—Dr. Yates spoke of the mental development associated with this malformation and some work which I have been doing this summer on the urinary tract leaves with me the impression that malformations of the urinary tract are frequently associated with malformations of the brain. This will be referred to in my paper tomorrow.

While the doctor was presenting this case I was reviewing in my mind the comparative anatomy of the pelvis. In all forms of the higher vertebrate we have complete bony vertebrae. The elements may vary in proportion as well as in their placement. For instance, the acetabular bone which in the mole is very large we very seldom think of in considering the human pelvis; and yet it is present, although not very manifest. In the lower forms of life, like the snake, the fish and the shark, there is an incomplete pelvic girdle. I know it is often said, the snake has no pelvic girdle, but in some of the larger ones of the Orient, like the cobra, they not only have a pelvic girdle, but they have hind legs. In the shark there is lack of fusion of the elements, which elements are connected with the pelvic fin. The bony fishes present another type in which the elements are united at the center and connect with the vertebral column. The amphibian has a complete pelvic girdle—while the elements may be cartilaginous, the girdle is always complete. So in nearly every animal, except in snakes, we have some form of a pelvic girdle, and except in the snake it would seem to be impossible to have locomotion on the ground without some form of pelvic girdle. In this connection it is interesting to note in this patient of Dr. Yates' how much locomotion is interfered with on account of the pelvic girdle deformity.

DR. ROBERT FARR, Minneapolis, Minnesota.—Is it not true that in most cases of exstrophy of the bladder we have the absence of the bony symphysis?

DR. RUFUS B. HALL, Cincinnati, Ohio.—The remark in reference to congenital absence of the vagina, and that these patients were mentally defective, brings up a point in my personal experience.

I was consulted some years ago by a woman, 36 years of age, a teacher physically well developed, with perfect development of the breasts, but she had never menstruated. She wanted to know if she could get married. She did not know why she did not menstruate. She had never been examined. A most thorough examination failed to find even the rudiments of ovaries or uterus. She had no vagina, otherwise the vulva apparently was all right, until you separated the labia you would think she was a normal woman.

Another case more recent than that was a married girl, and while she was not an imbecile, she was not bright. She married when she was eighteen. She was an orphan girl who had been earning her living since she was twelve years of age as

a domestic. She had never menstruated; she had no ovaries or uterus that could be found, and no vagina, and an attempt at sexual intercourse resulted in tearing her urethra open, and she had incontinence of urine when she came to me three weeks after her marriage.

DR. DAVID WILLIAM TOVEY, NEW YORK CITY.—I desire to mention the case of a young, well developed Italian woman, 24 years of age, married four years, she had no vagina. Her husband brought her to me for an operation and to find out if she could have children. At that time we did not know of the Baldwin operation but only the operation of making a hole for the vagina and transplanting some skin. As I have said, she had been married four years, and as near as I could ascertain from what she said, they had intercourse between her thighs. This woman disappeared from my observation. Later I was called to court and the judge annulled the marriage. The husband was willing to live with her if she could have had a vagina made.

DR. YATES (closing).—With regard to the locomotion, as far as I can see, she has as good locomotion as any child. As to her mental attitude she has no desire to play with other children.

Regarding exstrophy of the bladder in association with lack of union and fusion of the pubic bones, I will say that the point of Dr. Farr is well taken and commonly recognized. Fusion of these bones is not present when exstrophy of the bladder exists.

ABDOMINAL ADHESIONS

By Miles F. Porter, M.D., F.A.C.S., Fort Wayne, Ind.

THE surgical experience of the writer has certainly not been unique, indeed he has good reason for thinking it quite common. He has known many patients to have been operated again and again "for the relief from adhesions" without relief. He has known many patients to have been operated for "adhesions" when as a matter of fact they were suffering from an infection and not in the least from "adhesions." He has often known surgeons to put forth efforts to avoid adhesions which were often useless and sometimes harmful and at the same time apparently disregarded more potent causes of adhesions and other harmful effects as well. Because of the experience above recited and because of my belief that this experience is not at all common I have written this paper. I may not hope to offer anything new or strange but rather to re-tell an old story and perhaps recall some old facts which because of their antiquity are so familiar that they have lost in the esteem of some surgeons.

By the term adhesion as used in this paper is meant the abnormal joining of parts as a result either of trauma or infection or the joint action of trauma and infection. It is difficult to determine in some cases whether certain unusual and abnormal arrangements of the peritoneum are the result of disease or trauma or whether they are congenital. Especially has this been true in the writer's experience concerning unusual reflexions and attachments of the peritoneum of the descending colon. Some of these cases are in my opinion the result of a chronic colitis and while they aggravate the symptoms in some cases, the chief impediment in the way of recovery is usually the colitis and not the adhesions. In the treatment of such a case it may be wise or even necessary to remove the adhesions, but the cure of the colitis is after all the most important element in the treatment.

Without either trauma, or infection, or both, adhesions, as the term is used in this paper, do not exist. One is warranted it would seem in basing his diagnosis in a given case as between adhesions and congenital abnormalities of the peritoneum on the presence or absence in the history of trauma, infection or both. This differentiation may be quite important. It would be a surgical mistake to release abnormal peritoneal attachments that were symptomless. This is true whether these attachments are developmental in origin or whether they are the result of trauma or disease.

It has long been a rule with the writer never, in the course of ab-

dominal operations, to disturb old adhesions that have been and probably will remain innocuous. The importance of this point warrants emphasis. The danger of bowel obstruction or other serious accident following the so-called "thorough breaking up" of adhesions that are harmless is a real one.

Of course no surgeon of judgment would leave a band of adhesions that threatens bowel obstruction, or would he leave adhesions producing dangerous angulation of the bowel, and especially would he not leave such adhesions if they are comparatively recent and therefore still contracting.

Specific rules may not be formulated for the treatment of all cases but it should be made clear that adhesions are often entirely harmless and that harmful adhesions may follow the breaking up of harmless ones. In other words adhesions may be good, bad or indifferent, only the bad ones call for surgical interference.

Adhesions resulting from infection often disappear with remarkable rapidity and completeness after the removal of the cause, such as an infected appendix or tube. Moreover the disturbance of these adhesions at the time of removal of the source of infection adds to the risk of the operation from infection. It is the fashion these days to substitute instruments for fingers in the handling of tissues and in some respects the style is a good one and is to be encouraged; on the other hand in the writer's experience the substitution of harsh instruments for the fingers in the handling of delicate tissues, especially the peritoneum, is a surgical error not infrequently followed by untoward and sometimes disastrous results. Some of the instruments advertised for intraabdominal work are indictments of the surgical judgment of the surgeons whose names they bear.

What surgeon of experience has not seen delicate tissues dangerously traumatized and even gut walls perforated by the use of improper instruments, injuries that might have been avoided by the use of proper instruments or the substitution of the gloved hand for the instruments. I cannot refrain from reiterating here the fact that the efficiency of our aseptic and antiseptic efforts and the perfection of our surgical technic has led to an undervaluation of the importance of conserving the natural resisting power by avoiding all unnecessary trauma to the tissues dealt with locally, as well as unnecessary handicaps of the patient in the way of blood loss, time and degree of anesthesia, exposure to cold, etc. The writer has seen a number of unfortunate results following surgical operations which seemed to him to be clearly due to a lack of appreciation on the part of the operating surgeon of the dangers of undue trauma and exposure coupled sometimes he thought with an undue faith in his skill and technic.

Intraabdominal adhesions seldom give rise to serious symptoms unless they obstruct the circulation or the lumen of hollow viscera save when they are complicated by foci of infection.

Failure to appreciate this fact accounts for the many operations that have been and are still being done "for adhesions" without relief. The writer feels warranted by his experience in asserting that some of the efforts made to avoid adhesions have the opposite effect. For instance excision of a tube or appendix followed by a closure by stitches of the peritoneum is more conducive to adhesions than the removal of these structures with a simple ligature followed by carbolic treatment of the stump. This statement is based upon many observations at subsequent operations of sites of former appendectomies and salpingectomies with a view of determining which method of treating the stump was least likely to produce troublesome adhesions. The result of these observations is a firm conviction that by simply ligating the appendix, tube or cystic duct and treating the stump with carbolic acid one is not only using the technic least prone to lead to adhesions but the technic which is simplest, safest and on the whole therefore the best.

Refinements in surgical technic are to be practiced only when they are harmless. Prudery in surgery is as objectionable as it is in society and perhaps more harmful.

SUMMARY

1. Adhesions which are not obstructive either to the circulation or to the lumen of hollow viscera and are not accompanied by infection are harmless. Such adhesions met with in the course of abdominal operations would better not be disturbed.

2. Interposition of foreign substances between the viscera, either solid, liquid, semisolid or gaseous, will not prevent adhesions.

3. In the minimum conservation of tissues and general resisting powers we have the best means known today of avoiding harmful adhesions.

4. Undue efforts to do so-called "ideal" surgery are to be discouraged. Nature is a safer critic of surgery than is the surgeon.

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PARTIAL OBSTRUCTION AT THE DUODENOJEJUNAL JUNCTION AS THE CAUSE OF ULCER OF THE DUODENUM

By E. P. Sloan, M.D., Bloomington, Ill.

THE abdomen is divided transversely by the mesocolon. The liver, spleen, kidneys, pancreas, stomach and duodenum lie in the upper cavity and the small intestines in the lower. The contents of the stomach and the duodenum pass from the upper cavity into the lower through the duodenojejunal flexure which is situated in the opening through the mesocolon. The duodenum begins at the pylorus, is of an U, horse shoe, or triangular shape, encircles the head of the pancreas, and terminates at almost the same level as its beginning. Its shape is modified by the size, shape and position of the pancreas, stomach, liver and kidneys. Its form also varies with the position of the patient and with variations in the contents of the stomach and duodenum. In earliest childhood its form is almost circular and its outline regular and even. With the increase in size of the head of the pancreas and with the variation in position of the different viscera, especially if some enteroptosis occurs, its form and position are altered. The terminal portion at the duodenojejunal flexure is the most definitely fixed portion of the intestinal canal. Normally the pylorus retards for a time the passage of contents from the stomach into the duodenum, and the ascending portion of the duodenum retards the passage of the duodenal contents through the duodenum for a short time. However, when the duodenal contents have passed through the ascending and transverse portion and reached the terminal portion, where the gut passes through the mesocolon, there is normally no interference with its passage through this last portion of the duodenum nor through the first portion of the jejunum. It is obvious that any interference at the duodenojejunal flexure with the passage of the duodenal contents will cause retention in the duodenum with disturbance of its function. Partial kinking, twisting or undue pressure by other organs on any portion of the duodenum sufficient to interfere with the current of its contents will disturb the function of the proximal portion.

X-ray examination of the duodenum was much more difficult than that of the stomach until the duodenal tube came into use. Much has been learned by observing the very last portion of the test meal when it leaves the stomach and traverses the duodenum. When the stomach is empty, as it is when the last portion of a meal has reached the

duodenum the duodenum acts differently than when the stomach is partially full and emptying. As long as new portions of the stomach contents are being thrown into the duodenum the contents are forced along and there is no appreciable slowing up of the current even though partial obstruction near the terminal portion is present. But when the duodenal content is small in amount there is not enough bulk to force it through the obstructed portion. By filling the duodenum through the duodenal tube with bismuth in suspension while the stomach is empty, x-ray observation of the duodenum is almost as satisfactory as x-ray observation of the stomach.

In visualizing the duodenum, injection of air into it through the tube is sometimes of great assistance. Sometimes by injecting air into the empty stomach while the duodenum contains bismuth the duodenum, especially the first portion, can be seen with startling clearness. No other method gives such perfect visualization of the pylorus. Variations of the position of the patient from upright position to 45 degrees or prone, while the duodenum is under observation is of much assistance. In fact I consider these variations of position necessary for satisfactory observation.

The most frequent cause of partial obstruction at the duodenojejunal angle is the mesocolic band described by Wm. J. Mayo, in 1908. Until that time the vicious circle following gastroenterostomy was the terror of all operators. Since he published his description of this band and advocated its separation before gastroenterostomy is performed, the vicious circle after gastroenterostomy is rarely seen. However, he seemed to attach no importance to the presence of this band as the cause of duodenal ulcer.

My attention was drawn to its presence as a cause of duodenal ulcer in 1910. After separating the band that extended down for five and one-half or six inches below the duodenojejunal flexure the contents of the stomach and duodenum were seen to immediately pass down into the jejunum. The patient appeared to be dying upon the table and the abdomen was closed without performing a gastroenterostomy although the duodenum and the pylorus were apparently involved in a large ulcer and many large gallstones were present in the gall bladder. The patient recovered from the operation and was apparently clinically cured of the ulcer. Ten years later she was operated upon again for the relief of recurrent attacks of gallstone colic. At the second operation no evidence of ulcer could be seen. Cholectomy and appendectomy were done and she has remained clinically well to the present time.

In 1911 we observed by fluoroscopy the last portion of the test meal remain in the duodenum for over two hours. The stomach emptied in four and one-half hours, but enough of the last portion of

the test meal remained in the duodenum to be plainly seen for two hours longer. The action of the duodenum was carefully watched. Five hours after the meal was swallowed, half an hour after the stomach appeared to be empty, quite a mass was in the transverse and ascending portions of the duodenum. Ten minutes later it had returned to the first portion of the duodenum. A fairly well defined cap was present. Some of the test meal passed back through the pylorus and was plainly seen in the stomach. This last portion of the test meal made the excursion from the pyloric region to the distal end of the duodenum and back again about every twenty minutes. Pain was always present while it was returning to the pyloric region. At the end of six and one-half hours after the meal was taken the patient became very hungry and faint. Another test meal was given and the stomach commenced to empty rapidly. Three fluoroscopic examinations were made four weeks apart with practically the same findings. At operation we found, not the jejunomesocolic band we expected, but a very strong ligament of Treitz that was kinking the gut at the duodenojejunal flexure and holding it tightly against the head of the pancreas. Separation of most of the ligament of Treitz relieved the kink and afforded more room. Immediately the duodenal contents passed into the jejunum. Nothing more was done, although the large duodenal ulcer seemed to have invaded the pylorus. The patient made a good clinical recovery and no duodenal stasis has since been discovered although she has had several similar examinations.

Since that time we have demonstrated at operation that duodenal ulcer and partial obstruction at or near the duodenojejunal flexure were present at the same time and that surgical relief of the partial obstruction permitted the duodenal contents to immediately pass freely down into the jejunum fifty-two times, making with the two cases reported fifty-four.

In fourteen a definite jejunomesocolic band was present. In ten, veils or light adhesions seemingly of inflammatory origin definitely kinking the jejunum near its origin were found. In nine the obstruction was due to the irregular shape of the opening through the mesocolon or to the ligament of Treitz. In six of them the duodenum was ptosed to such an extent that a very acute angle was formed at its terminal portion. In fifteen cases the obstruction was due to more than one of these causes.

The operative procedure of the fourteen cases with jejunomesocolic bands consisted merely in separating this band up to the duodenojejunal flexure and covering over the raw surface on the under side of the mesocolon with peritoneum; then attaching the jejunum to the under side of the mesocolon in such a way as to approximate the

raw surface left upon the jejunum after the separation of the band with the under surface of the mesocolon in such a position as to eliminate the kink. In all these cases it was turned to the left, while before operation it turned sharply to the right. The appendix was removed in five cases, the gall bladder in four, both appendectomy and cholecystectomy were done in two. Nothing else was done in three cases.

In the ten cases due to veils or inflammatory bands the kinking seemed to be due more to twisting of the jejunum than to angulation. In two of these ten cases the bands extended entirely around the jejunum making a definite and inelastic ring that narrowed the caliber of the gut. Cholecystectomy was done in four of these ten cases, cholecystotomy in two, appendectomy in two, and both appendectomy and cholecystectomy in two.

In the nine cases due to irregularities in form at the mesocolic opening the condition seemed to be aggravated in four cases by a very low pancreas, and in five by a large irregular head of the pancreas. In two, severance of a portion of the ligament of Treitz seemed to relieve the interference at once. In four it was necessary to notch the edge of the opening in the mesocolon and to anchor the jejunum in a different position. In three cases it seemed necessary to separate several small bundles of fibers that appeared to be narrowing the opening and constricting the gut and then anchor the jejunum to the mesocolon for a short distance from its origin. Cholecystectomy was done in two cases, appendectomy in one, and both cholecystectomy and appendectomy in one. Five had no other surgical interference.

The six cases with ptosed duodenum were subjected to plication of the inferior layer of the mesocolon, notching of the edge of the mesocolic opening and change in direction of the first part of the jejunum. Three of them were subjected to suspension of the right kidney. One had appendectomy, four had appendectomy and cholecystectomy, and one had cholecystotomy.

In the fifteen cases with more than one cause for the partial obstruction, seven had ptosis of the duodenum and acute angle from fixation by bands or veils of the jejunum to the right. Plication of right mesocolon and notching of edge of opening and anchoring of jejunum to the left were done. Four had general enteroptosis, the gut was kinked at the flexure like a rubber tube hung on a nail. In these four cases the mesocolic opening was notched, the jejunum anchored in left position. A Bainbridge Intestinal Stasis operation was performed with a colon, kidney and liver suspension by the Hazen method. One had a strong jejunomesocolic band six inches below the flexure and many slight adhesions above that point with

thickening and dilatation of the jejunum proximal to the band. One had an apparent hernia of the terminal portion of the duodenum down through the opening. It appeared to be fixed at the right side of the opening but not at any other point; about 1½ or 2 inches of the left side seemed to slide down through the opening. Narrowing of the opening, anchoring of jejunum to the left and severance of several adventitious bands were done.

The other two cases had in addition to jejunomesocolic bands an irregular mesocolic opening that caused the gut to pass for a distance of one and one-half inches between the folds of the mesocolon before it emerged from between the layers. As some large blood vessels were in the edge of the folds the mesocolon was split anteroposteriorly and the peritoneum tucked into the enlarged opening and sewn in place. The jejunomesocolic band was severed and the jejunum fixed to the left. Four appendices and two gall bladders were removed and stones from the common duct in one. Nothing else was done in three.

These 54 cases of duodenal ulcer in which gastroenterostomy was not done were selected from a series of 264 consecutive cases of duodenal ulcer. The other 210 were subjected to gastroenterostomy.

During the same period of time 32 cases of ulcer of the stomach were subjected to gastroenterostomy. When any obstruction is present at the pylorus we consider gastroenterostomy absolutely necessary.

During this period of time, while the abdomen was open for other procedures we severed a jejunomesocolic band, separated adhesions or notched the edge of the mesocolic opening or the ligament of Treitz 310 times, when the preoperative diagnosis included "probable Ulcer of the Duodenum," but ulcer could not be definitely demonstrated at operation. Doubtless ulcer was preesnt in many of these cases but could not be demonstrated.

These fifty-four cases were carefully selected. All but eleven had some other operative interference at the same time, but the final clinical recovery from ulcer in all of these cases has been so satisfactory that we believe that obstruction at or near the duodenojejunal angle is at least one of the causes of duodenal ulcer.

Nine different times during the last two years the bismuth solution has been observed passing up into the bile ducts while the duodenum was being injected. In one case the gall bladder entirely filled and its outline was definitely seen by the fluoroscopy. By the time that a skiagraph could be made most of the solution had disappeared from the gall bladder and from the duodenum. Some very fine soft stones were present in the gall bladder and these showed up beautifully in

the skiagraph. They were doubtless still covered with a fine film of bismuth.

Wm. J. Mayo described the mesocolic band in 1908. Bainbridge has emphasized the rôle of obstruction at this point as a cause of stasis.

Moynihan says: "Of the existence of various membranous adhesions along the course of the alimentary canal there can be no doubt. * * * At the duodenojejunal flexure * * * they are plainly and frequently to be seen."

"We may therefore take it as proved that the various bands described in connection with the intestine do exist, though we may dispute as to their origin; we may agree also that undue delay in the forward transmission of the intestinal contents does occur, and that this delay is accompanied either by a form of subinfection, by organisms in varying degrees of attenuation escaping from the intestine, or by a form of intoxication."

Yet so far as I know no great significance has been attached to these conditions as the cause of duodenal ulcer.

CONCLUSIONS

Partial obstructions at the duodenal jejunal junction are sometimes the cause of duodenal ulcer or make the conditions favorable for its development. In some appropriate cases removal of these partial obstructions without gastroenterostomy will be sufficient for the cure of the ulcer.

PHYSIOLOGY OF THE EXTRA-HEPATIC BILIARY SYSTEM AND ITS APPLICATION TO SURGICAL THERAPY

By Chas. Gordon Heyd, A.B., M.D., New York, N. Y.

THE primitive gastrointestinal tract is a simple tube occupying the midline position. Embryologically it is divided into three portions—the foregut, the midgut and the hindgut. The stomach, duodenum, liver, biliary ductal system and pancreas are derivatives of the foregut and within this alimentary segment every digestive enzyme is elaborated and the mechanical and attritional processes of digestion carried out.

The stomach may be said to subserve two functions, namely, secretion and motion. Of these two, motor function is pre-eminently the most important. Digestion may be maintained for years with very little general disturbance of health so long as the motor function or evacuating power of the stomach remains intact. On the other hand, conditions associated with either loss of the normal evacuating power of the stomach or with a stenosis at the pylorus very quickly come to the physician for relief.

Contrary to the usually accepted idea of gastric physiology the terminal portion of the stomach is alkaline and in the fasting or resting phase of the stomach there is a reflux of duodenal material into the antral portion, the acidulation and acid digestion of gastric contents taking place in the proximal two-thirds.

With the exception of the anal canal the gastrointestinal tract is devoid of pain-producing nerve elements. Everywhere throughout its entire length the movements of the gastrointestinal canal are rhythmic and accompanied by specific and intrinsic chemical activity.

In attempting to interpret disturbed physiology in dysfunction of the external biliary apparatus we must recognize that the liver and its ducts are but one part of the alimentary system and physiologically conform to the fundamental neuromuscular mechanism that applies to the entire alimentary system. The underlying basis of physiological action of the gut tube is embraced in the so-called law of the intestine, a name given to it by Bayliss and Starling, sometimes called the law of contrary innervation of Meltzer. In simple language this law means that local stimulation of any segment of the intestinal tube causes a contraction above and a relaxation below the stimulated part. There is always a contracting impulse at the cephalic end and an inhibitory impulse at the caudal end.

As a corollary to the rhythmicity of gastrointestinal movement it

has been demonstrated that whenever there is an irritation of the gut tube, the portion above the point of irritation early participates in an exaggeration of its normal function. Meltzer maintains that "the law of contrary innervation is manifested in all functions of the animal body and a disturbance of this law is a factor more or less important in the pathogenesis of many disorders and diseases of the animal body." In the upright position the fundus of the gall bladder is at a lower level than its outlet. This morphological arrangement is true of all viscera that contain fluid and presupposes the ability of the organ to exercise contractile power and expel at least some portion of its contents. The gall bladder, however, is incapable of completely emptying itself and although non-striated muscle fibers are contained in its wall they are without any definite arrangement into a muscle layer and are too sparsely distributed to make a complete evacuating organ. In spite of the paucity of muscle fibers the gall bladder undergoes spontaneous rhythmic contractions from eight to ten times a minute. The lymphatic supply to the external biliary system is extremely rich and there is no anatomical partition or barrier between the intra-hepatic and extra-hepatic lymphatic distribution. The bile within the gall bladder is materially different from the bile secreted from the liver or from the bile contained within the ducts. The former is concentrated, darker in color, has a higher specific gravity and is chemically changed by the addition of mucin and nucleo-albumins. Rous and McMaster recently demonstrated that the passage of bile through the cystic duct concentrated the bile from two to four times, while the gall bladder is capable of concentrating the bile ten times in twenty-four hours.

The secretion of bile is continuous yet it is delivered into the duodenum intermittently. In other words, we have a continuous secretion with periodic delivery. Correlated with this is the fact that the secretory pressure of the bile as it descends from the liver through the common duct is by and of itself insufficient to overcome the sphincter of Oddi; even the addition of the contractile pressure of the gall bladder is insufficient to overcome the normal tonicity of the sphincter. There is required for relaxation an inhibitory impulse to allow the ejection of bile into the duodenum. During the fasting state the duodenum is free from bile and it has been demonstrated that the introduction of acid chyme, peptones, albuminose, or the irritation of the duodenal mucosa by a thread or a duodenal tube is sufficient to inhibit the sphincter of Oddi and cause the delivery of bile.

From a neuromuscular point of view the muscle fibers of the gall bladder and the sphincter of Oddi at the ampulla of Vater are an-

tagonistic in their action and the contraction of the former implies relaxation of the latter in a normal physiological biliary system.

A word of caution should be uttered here against applying in toto experimental data derived from research work on the biliary apparatus of normal animals. Clinical medicine and surgery are concerned with the gall bladder and biliary apparatus when it is diseased and the seat of dysfunction and the results of research can be applicable to human pathology only when research workers will operate upon sick animals or surgeons operate upon normal humans.

When we survey the gastrointestinal tract we are impressed with the fact that in the scheme of nature there are normal points of stasis. For example, at the pylorus, at the ileocecal sphincter and at the rectosigmoidal juncture we have normal points of stasis. In the gall bladder we have also a point of natural or physiological stasis and we might well question if it is not possible for a physiological state of stasis to become lengthened out into a condition with distinct pathogenesis. In other words we may pass from a physiological stasis into a pathological stasis.

The bile on its way from the gall bladder to the cystic duct does not re-enter the hepatic duct as the latter is closed by the mechanical pressure caused by the acute angle at which the cystic duct joins the common duct. The sigmoidal curve of the cystic duct, and configuration of the neck and ampulla of the gall bladder prevent overdistention and explain the mechanism of "white bile" or pressure acholia referred to by Erdmann and Heyd.

The fact that nature planned an intermittent delivery of bile into the duodenum must have a reason. In the fasting state the duodenum is free from bile. Therefore it must be conceded that in the absence of gastric contents bile should not be present in the duodenum. This is a functional advantage to the individual and represents a protective mechanism in order to have the duodenum empty of bile when there is no physiological demand for it. Morphologically the bile is delivered just at the partition between acid and alkaline digestion, at the point of transformation of chemical activity from an acid to an alkaline medium. The evacuation of gastric material in small amounts and at frequent intervals corresponding to the relaxation of the sphincter of Oddi clearly predicates that the bile will be delivered into the duodenum in response to the normal physiological demand.

The bile is not purely an excretion, for the bile salts are reabsorbed and undergo a more or less continuous circulation. One has only to recall the very marked improvement that takes place in patients who are losing bile through common duct drainage when they are fed their own bile. So impressed are we that in all cases of common

duct drainage we feed the patients their own bile. Cokeman shows that soon after a biliary fistula has been established the salts in the bile fall to one-tenth of the normal since reabsorption cannot occur. This suggests that normally bile salts are excreted and reabsorbed ten times before being destroyed or eliminated.

Bile is therefore delivered into the duodenum as the summation of three factors, the hepatic secretory pressure, the expulsive force of the gall bladder plus the action of respiration with the ascent and descent of the diaphragm providing a milking action. The maximum pressure exerted by the three is insufficient to overcome the tonicity of the sphincter of Oddi unless another factor is brought into play, namely, the relaxation of the sphincter. It would seem that as the gall bladder is incapable of completely emptying itself (in an examination of several hundred cadavers we have never seen' an empty gall bladder) it may be supposed that as the gall bladder becomes distended it becomes supersensitive to further distention and initiates a neuromuscular reflex which induces the reciprocal half of the reaction, namely, the relaxation of the sphincter of Oddi. When the gall bladder is absent naturally or after cholecystectomy the one half of this relationship is lost and the stimuli for the alternate contraction and relaxation of the sphincter is absent. Accordingly the sphincter ceases to function in the mechanism of biliary delivery so that in the cholecystectomized animal the biliary delivery is continuous and the change from intermittent delivery to a continuous delivery has been obtained by the extirpation of the gall bladder.

Repeated dissections in animals without a gall bladder show that the muscle fibers of the sphincter of Oddi are at all times present but not active and in humans with an incomplete or partial cholecystectomy there is formed an artificial gall bladder, or the cystic duct dilates into an adventitious gall bladder or diverticuli are formed throughout the ducts. In such cases we find that the sphincter regains its function and the intermittency of biliary delivery is again called forth.

At one time gallstones were considered the only pathological evidence of a diseased gall bladder and the finding of stones was interpreted as the essential pathological lesion. We now know that this is incorrect and that it is the infective process in the gall bladder or the biliary system that induces the pathological changes and provides the surgical indication. It is the deeper tissues of the gall bladder that are more particularly involved and 25 per cent of the lesions of the gall bladder that require surgical intervention are characterized by the absence of gall stones. An infected gall bladder, with or without stones, is an expression of a pathological change more widespread and extensive than that which is represented in the gall bladder itself.

It is possible to culture anaerobic bacteria from the bile radicles of the liver almost at any time and occasionally aerobes. Again under normal conditions of health there are occasional bacteria in the blood stream and it is by no means a rare occurrence to have apparently normal bile contain pathogenic organisms in the process of being eliminated by the liver. In the liver we have an intermediate barrier between the systemic and portal circulation and it is reasonable to suppose that there are very few cases of cholecystitis which are without liver involvement. These changes, when of mild degree, are in the form of a hepatitis and Graham has demonstrated a microscopic picture of hepatitis in every operated case of cholecystitis.

There are four theoretical ways in which the gall bladder could be infected. Of these, one presupposes a mucosal infection, the infecting organism reaching the gall bladder either by ascent from the duodenum or descent from the liver. Laboratory experiments demonstrate that it is with the utmost difficulty that the gall bladder can be infected from within its cavity. The injection of virulent streptococci into the interior of the gall bladder does not produce gallstones. Other pathological factors must be brought into play which lessen the resistance of the tissues beneath the mucosa. Coffey has demonstrated that the duodenum will rupture under pressure before there is a reflux of material up the common duct. It does not seem probable that cholecystitis commonly arises from infection by way of the mucosa. Two other possibilities for infection of the gall bladder are the bringing of infectious material through the blood stream or by contact from contiguous viscera. If the blood stream is the means of infection we must distinguish a straight hematogenous infection and an infection by means of the portal system. If the vascular systems were at fault one would expect that the liver tissue itself would show uniform changes throughout its substance but this is not true as we find that in infections of the gall bladder it is the right lobe of the liver that is coincidentally involved and particularly that portion in intimate contact with the gall bladder.

The fourth method for infecting the gall bladder would be by means of the lymphatic circulation and it has been proved by Sudler and the work of Franke, Sweet, Deaver and Pfieffer that there is a very intimate and extensive lymphatic connection between the gall bladder, liver, common duct and pancreas. Anatomically there is no separation between the extra- and intra-hepatic system of lymphatics and a hepato-lymphatic infection would offer a reasonable basis to account for most of the cases of cholecystitis. Rosenow in a series of very beautiful experiments demonstrated the possible source of cholecystitis from infectious emboli in the walls of the gall bladder and drew attention to the relative affinity of certain types of bacteria

for the tissues of the biliary apparatus. That this is a method of infection in certain cases cannot be denied but it must be relatively infrequent by reason of the comparative rarity of embolic processes of the gall bladder in any of the accepted forms of bacteremia.

It seems logical to believe that in the majority of cases cholecystitis represents a direct infection of the wall of the gall bladder, from an infected liver. Infection reaches the liver by the portal vein, involves the periportal tissues and induces a pericholangitis with involvement of the intra- and extra-hepatic lymphatics thereby bringing by direct extension an infection of the walls of the gall bladder. This would offer an explanation for the cholecystitis that is coincident with appendicitis, peptic ulcer, typhoid fever, suppurative hemorrhoids.

It has been our experience that the diseased gall bladders without stones are distinctly a greater menace to complete recovery and future well-being than is the less grossly changed gall bladder with stones. The palpatory diagnosis of disease of the gall bladder in cases not characterized by the presence of stones is fallacious and an opinion as to the normality of a gall bladder simply upon palpation through a lower abdominal wound is seriously open to question. There are, however, certain criteria which in the absence of calculi may collectively be taken to indicate that a particular gall bladder is pathological. Seriatim these may be defined as follows: (1) a loss of the normal color—under normal conditions the gall bladder is never white, brown or mottled, but always possesses its distinctly olivary green tinge. It is essential that the color of the gall bladder be noted upon opening the abdomen for upon exposure to the air it takes on a rather whitish appearance. (2) The walls of the normal gall bladder are quite thin and any marked increase in the mural thickness bespeaks infection. (3) The deposition of saffron colored fat well up to and on the fundus of the gall bladder is distinctly abnormal and represents infiltration of the wall. (4) The presence of varying degrees of pericholecystitis is suggestive only. Personally we are unable to account for some of the many adhesions that exist between the duodenum and gall bladder, including the so-called cystico-duodenal and cystico-colonic ligaments which Todd states are present in one out of four individuals. We have found adhesions so frequently in apparently normal persons without any disabling angulations and so far as we can determine in patients free from upper abdominal symptoms that the evidence of occasional adhesions between the gall bladder and colon in the absence of symptoms must be accepted as of minor value in determining the degree of pathology in the gall bladder. (5) The inability to express bile from the gall bladder by manual compression is of very little diagnostic importance

and is not necessarily indicative of pathologic change. By the peculiar "S" shaped conformation of the cystic duct and ampulla the gall bladder can be distended almost to the point of rupture without allowing any bile flow through the cystic duct. Adhesions angulating the cystic duct can bring about the same condition without intrinsic disease of the gall bladder being evident. (6) The presence of hyperplastic lymph glands along the course of the cystic and the common duct is indubitable evidence of infection, past or present, of the biliary system, for the mechanism of lymphadenitis is the same in the biliary system as it is elsewhere in the body and adenitic hyperplasia represents infective irritability. (7) The finding of a papillomatous mucous membrane, rather than the normal smooth type, with minute cholesterin crystals imbedded in its substance is of primary importance in the diagnosis of the so-called strawberry gall bladder. We place little value in the so-called inspissated bile as an evidence of infection primarily, because it is the normal condition for bile to be inspissated or concentrated within the gall bladder. (8) The presence of white plaques extending from the serosal covering of the gall bladder to the under surface of the liver. They represent, to our mind, fibrosis in liver tissue concomitant or sequential to gall bladder infection.

In conclusion we may say that with a normal liver and biliary system the plan of biliary secretion and elimination is excellent. Surgery, however, is undertaken for diseased conditions of the biliary system and increasing clinical experience demonstrates that ablation of the gall bladder is without any change in the health or metabolic processes of the individual. By reason of the fact that infection in the gall bladder is preponderantly a mural pathology the most reasonable and best means of curing this condition and interrupting the vicious circle of liver-gall bladder infection and gall bladder-pancreas infection is to remove the gall bladder, namely, cholecystectomy.

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A CLINICAL CONSIDERATION OF TUMORS OF THE BREAST

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THE most gratifying statement that can be made by a physician to a patient who consults him about a swelling in the breast is: "You have no cancer."

In correlating my material for this paper I have collected from my card index all operations upon the breast except those for mastitis, either chronic or suppurative, from January 11, 1905, to and including May 10, 1922, about 18 years, and find 468 cases recorded. There were also in this series 20 recurrence operations, which were in part mine and the remainder patients of others, one of these being operated upon four times in the scar and remote areas. Of the operated cases 281 were carcinoma, one of the entire number being a well advanced bilateral manifestation. There were 120 cystadenomata of which 102 were unilateral and 18 bilateral; sarcoma, 1; tuberculosis, 1; lipoma, 4; aberrant breast, axillary, 3, one of which was carcinomatous; adenofibromata, fibrocystadenoma, 27; and peri- and intracanalicular fibromata, 31; in all 58 (including intracanalicular cystadenoma and intracanalicular papilloma, etc.).

It will be observed that 60 per cent of all the cases selected for operation were carcinoma. This number does not represent by far the patients seen with cystadenomatous degeneration of such slight degrees as to be considered nonoperative. Neither does the large number of cystadenomatous breasts operated upon represent any evidence of operative furor in this pathological class, but they were in all instances patients with this type of degeneration so far advanced as to demand operative relief. Numbers of them had had single cyst operations done on various occasions, one in particular asking for radical relief after five individual operations by various operators had been done, each operation guaranteed as the last of her trouble.

It has been my experience to see but one tuberculous tumor and one sarcoma in this period of time and one aberrant breast undergoing malignancy, which finally required a re-operation, including the formerly normal breast.

There is but one instance in the carcinomata in which the second breast was invaded. This patient was inflicted with the second growth so remotely placed from the chain of lymphatics as to lead me to consider the tumor of primary origin, equal to that of the first breast. There was one bilateral carcinomatous involvement almost

equal in both breasts. The case is so interesting as to deserve recording.

C. M., forty-seven, single, admitted to hospital, March 17, 1921, discharged March 28, 1921. Presented tumors of the breasts, duration seven months. Family history, negative; no operations, no sickness. Personal history, never married; menopause two years ago, some slight spotting since. Present trouble began seven months ago, no pain, no discharge from nipple; no loss in weight. Physical examination, negative. Surgical condition: Definite asymmetry of the two breasts. The left presents a flattened out and retracted nipple. The entire breast is hard and rubber-like in consistency. It moves as a whole on the chest. There is a large, hard gland in the axilla, freely movable, hard and smooth. Right breast: very hard, especially about the nipple; no retraction of the nipple, but the skin retracted in other areas and was very adherent to underlying tissues. There were a few very small hard nodes in the axilla. Operation: bilateral Stewart incision; Result: Primary union. Pathologic Report: Bilateral scirrhous carcinoma, metastasis to lymph glands.

The pericanalicular and intracanalicular tumors were seen usually in the female from 17 to 35. The cystopapillomata, of which quite a few were recorded, were easily diagnosed at the first visit by the characteristic discharge from the nipple. In the nonrecorded cases of mastitis, I am quite satisfied that two recently operated upon were fat necrosis cases of the type described by Burton Lee. In neither of these did I remove more than the areas involved.

As to the question of bilateral involvement being primary or of the second breast being invaded through lymphatic conveyance, one is unable to decide, but I am rather fixed in my opinion as to the two patients specially cited. In the instance of the patient with the immediate bilateral involvements I am inclined to believe after very careful examination and cross-examination that the breasts were simultaneously invaded by primary growths, or almost so; at least I believe that neither growth was a metastasis from the other.

In a patient with involvement of the remaining breast four years after the first removal, the zone occupied, the discrete type of tumor, absence of any infiltrating process from the removed side and the absence of evidence by x-ray or any other metastasis, led me to a positive conclusion that involvement of the remaining breast was as much of a primary growth as the tumor in the removed breast. Unless we can definitely trace the metastatic chain across the breast, such instances as the one just cited should be classed as primary and not as metastatic.

In this series of patients but three were in the male,—one a recurrence and two primaries. I have previously reported (Dennis; System of Surgery) three male patients with tumors of the breast.

DIAGNOSIS OF MALIGNANCY

The most frequent reason that patients advance for suspecting malignancy is pain. It is most gratifying to be able to tell these worried callers that malignancies of the breast never begin with pain; that when pain is a symptom of cancer it requires no expert to diagnose the condition, this pain being due to compression involvement of the nerve, infiltration, or a large tumor, or exposed nerve filaments in an ulcerating tumor; that as a rule, malignancy of the breast is a single tumor, as compared with multiple tumors in cystadenoma, fibroma, etc., although one occasionally sees a malignancy present with a well defined multitumor of the cystic variety. Recently I removed a carcinomatous breast with two distinct nodules, four inches apart. The bilateral tumors are most frequently the cystadenomata and fibromata.

No better diagnostic objective evidence is known than the dimpling of the skin when the breast is grasped, as compared with the full rounded convexity in the noninvolved by malignancy. This dimpling sign is obtained very early. By lifting the breast from below, or by compressing it between two or more fingers, the dimpling will readily follow, while in the noninvolved breast, the convexity will remain or be exaggerated. This dimpling can also readily be seen either by direct or by oblique inspection, and by feeling carefully over the dimple one obtains with the palpating hand the sense of hardening or tumor. In more advanced patients, or in patients with a more disseminated growth, the classical orange peel skin is seen. The elevation of the breast affected, above the plane of the other, due to the lifting effect of the involved tissues, is seen in more advanced conditions.

If one were to rely upon retraction of the nipple for a diagnosis, operations upon the breast would be more common than those for the appendix. In a very large proportion of breasts there are single or bilateral retracted nipples that are absolutely normal otherwise. The retracted nipple of malignancy is due to the same cause as the dimpling of the skin mentioned above. Eversion of this latter type of retraction is impossible, while in the normally retracted nipple eversion is quite possible in the great majority.

Axillary Adenopathy. It requires an exceptionally enlarged gland to be found on palpation in the majority of patients, or an exceptionally thin subject is essential.

Metastases are important in their bearing upon the question of operative justifiability. One cannot be too careful in the readily palpable tumor in the search for secondaries, of the mediastinum or lungs, characterized by a dry cough; in the bones by pain allied to nerve distribution pains, such as facial, intercostal, and in my experience, frequently in the course of the sciatics, one or both.

One of my patients lived 11 years after a very extensive dissection. The first evidence of metastasis was hoarseness, increasing slowly in intensity. It was not suspected that the hoarseness was in any way due to metastasis from the growth removed almost eleven years before until x-ray showed a tumor, the shadow of which was the size of a tangerine orange and situated at about the arch of the aorta.

As far as my personal observations go, I cannot encourge the idea that metastases occur in the abdominal viscera in such frequency as we are led to believe by various observers. Therefore I am not inclined, in all patients, to practice Handly's resection of the upper segment of the rectus fascia, although I frequently do it.

In addition to the remote sites mentioned, the immediate sites call for consideration. Recurrence in the scar can be assigned to too small a skin flap removal, implantation by the using of forceps in the flap edges that have not been properly cleaned after use in the ablated portion, the conveying of cells on the gloves, towels and other instruments that have come in contact with the removed area. The fact that cells may be lodged in the lymphatic channels at a remote area must account for those shot-like bodies, seen at a distance from the breast involvement, even at times on the back, the scalp, etc. Occasionally the shot-like masses in the area formerly occupied by the breast are cystic formations about a ligature, etc., and will disappear in time.

No breast should be removed when the supraclavicular and cervical glands are so metastatically enlarged as to be readily palpated, but should be subjected to x-ray or radium for a time. This same statement holds in those patients with massive skin infiltration. I have recently had a marvellous disappearance of the skin infiltration in a woman of thirty-eight after x-ray application by the more recent high voltage machine, although the tumor proper maintains its original size after six months' treatment. No breast should be operated upon with a promise of cure or a great extension of life in which the growth, ulcerated or not, is adherent to the chest wall. This type should also be subjected to the ray or radium treatment, exceptions being in the instances when one can remove the ulcerating tumor and cover either by plastic or by grafting processes.

Neither do I believe that tumors should not be operated upon, but instead, treated by x-ray, when they are small. A regrettable incident occurred in my practice last year. A patient with a small nodule in the upper inner quadrant was advised by me to be operated upon. However, she had a relative, connected with a large hospital, which deals largely with malignancies and is well furnished with radium and x-ray appliances. By this overenthusiastic relative the patient was given every confidence of cure, and I lost sight of her

for six months. Upon her return to me at the end of this period, during which, she stated, she had been told that she was cured, the growth was still present, decidedly larger, and in addition there was distinctly evident adenopathy. Operation was again advised and consent at this time given. The growth was carefully examined by the pathologist, and no cell changes, due to x-ray "sickening," were recorded by him.

Recurrences may be exceptionally rapid, and again very slow. The explanation for either is not to be obtained from the pathologist. At times, he will predict rapid recurrence, as was done in the patient with mediastinal growth eleven years after the operation. This patient was considered by two pathologists to be liable to a rapid (six to twelve months) recurrence, and without x-ray or radium treatment, lived eleven years before showing a suspicion of a secondary tumor. No autopsy was done in this case, so that even with the x-ray picture we are still in doubt as to the nature of the growth. The youth of a patient, as in cancers at any site, tends to produce early or rapid recurrence or metastasis. The zone of the tumor, I am led to believe, may also be a factor in rapid metastasis. My most rapid recurrences under this heading are secondary to tumors in the axillary border of the breast, and also in the fat type of patient more frequently than in the lean.

The question of doubt in diagnosis is settled in the majority of instances by an immediate pathologic examination of a frozen section. I do not believe that a wide resection of a growth for immediate analysis endangers the patient at all. I cannot make the same statement for those patients in whom the specimen is removed days or weeks before the breast is removed. The clinical picture on gross section of these questionable growths is as a rule so clear that the experienced operator in the majority of instances does not require the microscope except as a confirmatory means.

X-ray or radium as a preliminary to operation is in my opinion at the present time a "follow the leader game" that will require some years to satisfy us definitely as to its practicability. Use of these agents subsequent to operation is today largely enhanced by the advertisements they have received in the public press and by the friends of the patient. I must say that my cases longest free from metastasis were not treated with x-ray, as at that time x-ray and radium were not in their present-day development.

To be effective in the prolonging of life or making a cure, at present the most painstaking and extensive dissections are necessary. I am unfortunate in this discussion in being unable to bring before you statistically my recurrences as to site and time as but forty-three replies were received to 150 questionnaires sent; neither am I going

to entertain the question of pathology. The most radical operation consists in the complete resection of the pectoral muscles, cleaning out the axilla of glands and fat, and extending the excision at times to the supraclavicular space. I have not practiced the removal of the pectoralis minor, except when unable to freely approach the vessels and nerves of the axillary and subclavicular zone. No functional disturbance follows the removal of both pectorals, therefore no hesitancy in removing them should exist.

The questions to be considered in a breast amputation must be: Is it justifiable from the standpoint of recurrence or metastasis? Is the mortality chance sufficiently low? Will the function of the arm after operation be preserved? The answers to the two preceding questions are self-evident, as a rule.

The arm function should never be involved. Free motions are always possible when orders for motion are properly carried out, in practically every incision devised. The greatest impairment of motion may arise in the Willy-Meyer-Halsted incision of years ago, where the axillary edge of the pectoralis major is followed. This line of incision when healed has to be stretched when abduction is instituted and therefore in the nervous, hypersensitive, etc., limitation may be the result. If on the other hand the modified incision be used in which the incision slopes gently over the deltoid with convexity upwards, when the arm is abducted the positions of origin and termination of this type of incision are brought nearer together. The Stewart incision has been used in over 75 of my patients since 1916, with no great difficulty in exposure and no great obstruction to motion after the first few weeks, although many patients complain that the upward (abduction) movement drags on the chest wall scar in the early weeks following operation. The advantage of this incision is purely cosmetic and should be used in selected cases only.

The mortality in my carcinoma cases was one, and this death was partly attributable in all probability to a siege of streptococcus hemolyticus infections that we had in the hospital at that time, also due to a second operation being done within eight or nine days later. This patient refused anything but a removal of the suspicious growth and demanded waiting for eight or nine days after being told that the pathologic report was carcinoma. On operating radically, the area from which the tumor was removed was found filled with clot and the surrounding tissues ecchymotic. A complete removal was done, a rapid rise in temperature to 103° in two days, purulent metastasis was observed all over the body, joints, cellular tissue, etc., with death resulting in ten days. Culture returns from the pus at the various sites was always that of streptococcus hemolyticus.

It is rather pleasing to record relatively few chest complications

in so large an area of exposure to trauma and infection in the respiratory area.

Cystadenoma, single cyst, or the blue dome cyst of Bloodgood, cystofibroma, multiple cyst, intracanalicular, pericanalicular, or adenofibroma are as a rule all readily diagnosticated.

In the cystadenomata and multicystic breasts one feels a single or many small nodules. Very often careful massage from the periphery to center will cause to be extruded from this nipple a fluid varying in color and consistency from watery to pale straw to purulent or milky or even bloody or chocolate brown appearance. In all but the bloody or chocolate colored fluids one can safely say that he is dealing with a benign condition. This type of growth is also prone to be bilateral and among its many names, the term "old maid's breast" is frequently applied. When the discharge is bloody or chocolate colored the diagnosis is usually that of intracanalicular papilloma or a papillomatous cystadenoma. Again this type of discharge may be due to bleeding from a nonpapillomatous cyst with a malignant growth in the wall of the cyst. In the latter instance the precautions taken in a definite malignancy had better be observed. By careful palpation one is often able to outline a tumor in the area circumscribed by the outer margin of the areola and usually close to the nipple. On section of this tumor the eye frequently sees the cockscomb-like papillomatous growth; these usually grow from the inner wall of one of the larger ducts. The question of these papillomata being malignant is disputed by many. I believe that a papilloma of the breast is as dangerous as a papilloma of the bladder or rectum, etc., and that therefore radical removal is in order,—at least the removal of the breast is demanded.

In an article (*The American Journal of Surgery,* January, 1912) I called attention to this type of tumor, recording a series of seventeen patients and several illustrations taken from the removed breast, presenting very typical papillomatous growths and cited the work of A. A. Strasser, Arlington, New Jersey, who credits Bowelly (St. Bartholomew's Hospital Reports, 1888) with being the first to use the term duct papilloma, etc. I further stated that the question of malignancy in the early stages can be answered in the negative, but that they do become malignant, as evidence, Greenough and Simmons report 14 per cent in the pedicles and Bloodgood at that time claimed 50 per cent in the cases observed at Johns Hopkins. My conclusion in this quoted article was that in small growths, excision of the growth suffices,—while in larger growths amputation of the breast is imperative. I shall modify this now by saying that I feel that all papillomatous breasts should be amputated.

Canalicular Fibroma, Intra- and Peri-.—In one instance a very large

growth, including the left breast, weighing five pounds, was removed, the clinical diagnosis of which was sarcoma, the pathologic an intracanalicular fibroma with no gland invasion. Complete removal was done. Six months later the patient coughed up a piece of tissue. Pathologic diagnosis was sarcoma. At about the same time the entire cutaneous area was involved with growths from the size of a French pea to a hazelnut. These were subsequently pronounced sarcoma. The inference is, either that the slides were wrongly read by the first pathologist, or that the original canalicular growth degenerated into a sarcoma at some point that escaped the pathologist's attention.

As previously stated my list of operations for cystic breasts does not represent an operative furor—these operations were done for demand reasons, persistent soiling of the linen by leakage, rapid growths, reoperative disappointment, and fear of more operations on the part of several who had from two to five removals done with palpable recurrences, rather new growths or young cysts enlarged.

In those patients in whom we intended removing a single cyst, but whose breast tissue we find studded with numerous cysts, in size just visible to that of a French pea or larger, I for a time did a subcutaneous resection, leaving the nipple, then for a period I removed breast tissue and the nipple, while now, after explaining the two methods, I follow the patient's wish of leaving the nipple or removing it.

These patients do not have the feeling of mutilation, as expressed by Bloodgood, and more recently by Peck. I feel that if they are to have the operation created in their minds many times by propagandists and annual cancer weeks, newspaper notoriety, etc., a placid mentality due to a complete operation is far better than a diseased mentality with a less radical operation, not only for the tumor-bearing individual, but also for each of her relatives and friends.

While cancer week notoriety and propagandism is desirable, nevertheless I have found from my office experience that a great deal of unnecessary mental suffering is created during these periods.

In the single growth, the blue-dome cyst of Bloodgood, the discrete fibroma and the canalicular growth, the operation of removal resolves itself into a resection of the area well outside the tumor, with proper suture repair.

In conclusion I should like to emphasize the belief on my part that a growth in the remaining breast is as likely to be of primary origin as that in the breast first removed.

Further, that at the present day we are unable to state what the influence of x-ray and radium is, either as a preoperative or postoperative aid. But in view of many apparent reductions in size, etc.,

previous to operation in cases considered nonoperable, the use of x-ray and radium should be encouraged. Even in view of some of the glowing reports at present regarding nonrecurrence, postoperative treatment should be substituted for preoperative, until some definite proof of its help or inefficiency has been established, since too few years have passed in my opinion for positive results to be shown.

Further, that in the presence of late metastases the powerful currents of the present day should be given a thorough test to prove or disprove the efficiency of this method of treatment.

That the most thorough and painstaking wide removal, with remote glandular and fascial dissections will tend more and more to increase our percentage of cures and extension of life. That the radical operation is attended with so low a mortality as to promote a greater desire on the part of consulting physician to demand operation.

60 West Fifty-second Street.

DISCUSSION

DR. G. VAN AMBER BROWN, Detroit, Michigan.—A number of years ago I heard Murphy declare that in carcinoma of the breast metastasis never takes place in the pectoral muscles. He therefore did not advocate their removal. I was also surprised to hear Dr. Crile make a similar statement. When I returned to Detroit I took the matter up and considered it with Dr. Davis. Within a very few weeks he called me into his laboratory and showed me what was very obviously a cancerous area located between the pectoral muscles. This checked up with microscopic findings. Since that time he has possibly in four cases called my attention to a similar condition of affairs.

DR. JAMES E. DAVIS, Detroit, Michigan.—Dr. Erdmann has dwelt upon the points in diagnosis that can be used before the gland is removed and this is exceedingly important. He has also spoken of the difficulties in making a laboratory differential diagnosis of malignancy or nonmalignancy. Really, the difficulty sometimes is truly very great. Many pathologists believe that practically all of these malignancies begin in the ducts. Supposing this to be true, in order to get an involved section it would be important to take representative parts for microscopic study from all of the gland removed. That, of course, is practically impossible in daily routine work.

I was glad to hear Dr. Brown call attention to extension of the disease into the muscle. I will ask Dr. Erdmann to speak about this involvement as an influence upon the ultimate prognosis. I believe when the tumor has invaded the muscle a poor prognosis should always be given. That metastasis does involve the muscle more frequently than many writers and workers have supposed, I am thoroughly convinced, and I have in my laboratory abundant proof of this fact.

In regard to the treatment by the x-ray or radium, and also the examination of the tissue section after treatment has been given; the difficulties in the way of successful treatment may be very great because the cellular pictures brought about by the ray are of such a character that the detection of physical and chemical changes in the cells is easily made but there is no way of telling when the cancer cell is killed.

I have a very excellent histologic example of an unsuccessful treatment. In

this section are two nests of cells beginning growth. This breast was treated by the direct method, and a section was taken eleven days after the fourth radiation. Had this section been obtained a few days earlier the growing cells would not have shown at all, and the pathologist would have been justified in returning a diagnosis that the cancer cells had been killed. They were not killed as these later developments show.

DR. JOHN W. KEEFE, PROVIDENCE, RHODE ISLAND.—With reference to removal of the pectoralis major, any surgeon who has operated many times on carcinomas of the breast has seen involvement in the muscle structure, oftentimes beneath the fascia covering the muscle. To my mind the pectoralis major should be removed in every instance for, as the writer stated, the motion of the arm is limited to a slight degree, if any, by its removal.

I feel the public should be educated to know that any growth or swelling of the breast should be investigated by some competent physician. Dr. Erdmann seems to think that some people have had unnecessary fear. This may be true, but the good, to my mind, that will come from the education of the public will be more than counterbalanced by the fear some people may have. I have had a few instances, however, where knowledge of that condition did not seem to impress the patient. I saw a woman recently who had had her breast removed by another surgeon six years previously, and she came to me with a carcinoma of the opposite breast. She had allowed eight months to elapse after she had first noticed the swelling in the opposite breast. I had another patient within a year who, although she noticed the growth of the breast in February, delayed operation until July, so that it is a rather difficult problem to educate people so that they are sufficiently impressed to have the trouble attended to at once.

DR. GORDON K. DICKINSON, JERSEY CITY, NEW JERSEY.—Just over the pectoral muscle is the broad deep fascia of the body, which is a subsoil for infiltration for cancer cells which may spread in all directions. It is generally a barrier for quite a while; the cancer cells may spread along the lymphatics, and that is why in going down over the epigastrium and taking up the fascia and resecting it we have a certain amount of controlling influence over this infiltration. My pathologist has more than once shown me cancer cells in the pectoral muscle underneath the fascia. Heidenhain says they do exist and proves it, and so does Handley.

DR. EDWARD J. ILL, NEWARK, NEW JERSEY.—I believe in educating the public early in regard to cancerous symptoms, but the more I have been trying to educate the public to take no chances, the more I feel there is need for this kind of education. However, what we need is to educate the profession as a whole in regard to the earlier symptoms of carcinoma. In very many cases we do not ourselves get these tumors of the breast for early operation. We should get at the cases as early as possible for operation if we are in doubt. A frozen section at the time of the operation is not by any means satisfactory. I have sometimes removed the whole breast to find out afterward that it was not necessary at all. I described a papilloma of the duct before this Association twenty years ago, and I thought I was the first one to settle definitely the pathology of that form of tumor. In the fourteen cases I described at the time, there were two cases that had gone for a great many years without recurrence. One patient was dead. I got the entire wall of the tumor. The other patient has died since, and she has had a growth for thirty-five years and has never had any difficulty. So no doubt a great many of these cases recover. At the time, in talking to some of the older members, they remembered two such car-

cinomas. I have seen one papilloma. The condition is rather different from a nonmalignant papilloma. Its fixation in the tissues around it is very early. The character of the fluid that comes from the nipple is quite different. It is usually more bloody and contains many cells that do not occur in a simple papilloma. The fluid in a papillary cystadenoma (nonmalignant) is of a more serious character. It contains a few leucocytes and some black glandular matter, while in the midsection of the tumor one invariably finds epithelial cells in more or less large numbers and a larger number of blood cells.

I feel like some of the other speakers do, that we must remove the chest muscles with the breast and in one piece. I believe that the whole axilla, all the muscles, must be removed without touching the tissue between the original tumor and the axillary cellular tissue. The moment you cut through between the two you infect everything. I have been able to dissect out the lymphatics in the form of a V-shape, showing malignancy. But how are we going to continue? On my return from Erlangen, I was surprised at the amount of work (nonoperative) they have done there for the cure of cancer. I have had a chance to examine a cancer of the rectum where we had a definite history about two months ago, and the cancer has entirely disappeared. It is not enough to use four radiations. They use an apparatus that carries 280,000 volts and keep the patient under this from two to eight hours; then they nurse the patient for six weeks and repeat the radiation once.

DR. ERDMANN (closing).—From the tenor of the remarks that have been made, I have been misunderstood in regard to the question of muscle excision. I distinctly stated that I do not always remove the pectoralis minor muscle, but I always remove the pectoralis major. I have never seen metastases in the muscles of the chest wall, except where the tumor operated on, primarily invaded the pectoralis major or minor. None have returned to me in that condition. In a freely movable carcinoma of the breast, where there is no adhesion of the chest wall, as I stated, I have not seen muscular implantation. The implantations or metastases have been more frequently those in the spinal column, the bone metastases causing pressure on the nerves of exit. A number of patients have been treated for sciatica after the operation. It is a metastatic pain and not a sciatica due to the involvement of the patient's constitution. I have seen pressure on the thoracic nerve, and I recall one patient who died six hours after the injection of Beebe's serum. This patient had thoracic involvement. Only one dose of the serum was given. She had been in excellent condition before she got the dose of serum.

With reference to the statements made by Dr. Keefe in regard to cancer propaganda, I do not wish to be understood as not believing in cancer propaganda, because I am a firm believer in it. When women present themselves with tumors of the breast, either involving one breast or the other, we advise them to have these tumors removed at the earliest possible date, but we know it takes months for people to get rid of the propaganda scare.

With reference to the frozen section, I fully agree with Dr. Ill. There are times when a frozen section is reported negative, and the pathologist at the hospital may take a week or ten days before he tells you that the tumor is not malignant, and finally he may come to the determination that it is malignant. In one case of fat necrosis of the breast we had the patient on the operating table mentally nine different times within a week. The conclusion reached was that the tumor was not malignant. The patient still lives, now over a year, without any evidence of malignancy. When the report is negative and you think you have the question of malignancy to contend with, it is better to remove the tumor.

THE TRAGEDY OF A SACRAL PERIOSTEAL SARCOMA

By Francis Reder, M.D., St. Louis, Mo.

THE etiologic factors of malignancies still remain labyrinthine to the great army of research scientists in their indefatigable search for a cause, while the therapeutic agencies generally in vogue at the present, leave the impress of an alchemistic effort. Wonderfully great have been the achievements of the physicists in constructing a most powerful x-ray apparatus of high voltage capacity to be utilized for the production of the hard x-rays, and equally wonderful have been the advancements made in the utilization of the highly penetrating gamma rays of radium. It has carried many of us into the ultraenthusiastic zone, and has caused us to become infected with much of the fervor of our inspired colleagues who are visualizing marvelous successes with the x- and radium rays. In time we have infected our patients with this selfsame enthusiasm, and implanted in them a hope for which we must feel responsible.

I admit that it is a great comfort to be relieved of a patient with a malignancy in which surgical measures have failed, and to be able to find hopeful recourse in a new branch of medicine whose success is proclaimed with convincing earnestness.

Well be it that access to such encouraging aid is at our disposal, for were it not, the spirit of the surgeon and the patient would soon be daunted and hope lost. Hope, though the patient's condition presages no encouragement, must not be lost, for this virtue is the vitalizing bond which unites the soul to the great and good in every age, it is a link whereby our life takes hold upon the eternities to come.

In narrating the clinical history, course and treatment of this particular case, I am merely portraying to you a clinical picture, which, during the first six months, misled the skill of an able physician; a clinical picture revealing the suffering and courage of the patient, and a clinical picture disclosing the great disappointment engendered by the most modern methods of treatment.

This patient experienced some two months before consulting a rectal specialist a heavy, throbbing sensation, with occasional lancinating pain in the lower part of her rectum. Six weeks after the onset of her "rectal trouble," bowel actions were becoming painful. The rectal specialist recognized the condition as "Hemorrhoidal" and for five months gave assiduous treatment, without relief.

On May 25, 1921 I saw the patient, a woman forty-five years old, well developed and fairly healthy looking, her face, however, giving expression of much suffering.

The pains in her rectum had grown more severe, especially at night, and were radiating up her back, causing her sleep to be much disturbed.

Rectal examination conducted in a very gentle manner, and without instruments, caused intense pain. Several small internal hemorrhoids were palpable. They were, however, too small to cause such suffering. Insinuating my finger to its full extent into the rectum, the anterior surface of a mass about as large as a tangerine, globular in shape, could be palpated through the posterior wall of the bowel. The location of this mass corresponded to the sacrococcygeal joint. To the sense of touch this mass appeared soft, doughy and fixed. The diagnosis of a sarcomatous growth was made. The likelihood of a cystic tumor (dermoid) was not altogether excluded, although any evidence on the skin usually associated with this class of tumors was entirely lacking. Sentiment was greatly responsible for entertaining the latter diagnosis.

The condition was clearly a surgical one and a request for operation was promptly accepted.

On May 27, 1921, with patient in the Bozeman position the tumor mass was excised. On account of the character of the lesion extreme measures were resorted to in dealing with neighboring tissues.

The coccyx and a portion of the sacrum corresponding to a line drawn a little above the second sacral foramen, were removed. The musculature of the posterior wall of the rectum to the extent of 2 to 2½ inches was removed down to the submucosa.

In dissecting out the tumor mass, which was globular and as large as a small tangerine, no difficulty was encountered. It was readily enucleated. The reddish brown color and characteristic substance of the tumor made recognition easy as soon as the "capsule" was incised. In using the word "capsule" in connection with this tumor, I am simply stating the gross appearance of the tissues as they presented themselves during the dissection. In this particular case the appearance as to an encapsulation of the mass was strongly deceptive.

Pathologists inform us that sarcomata are not encapsulated; that a microscopical examination of the capsule and of the tissues immediately outside of it shows that what appears to be a capsule is the connective tissue around the periphery of the tumor, which tissue had become condensed by pressure, but which holds in its meshes young sarcoma cells, which are also found in a zone of lesser or greater width in the adjacent tissues; furthermore, the enucleation of a sarcoma is invariably followed by a speedy local recurrence, the best possible proof that the "capsule" does not indicate the limits of the tumor, and is in reality a pathologic delusion.

This teaching was keenly appreciated, and the "capsule," after its interior had been subjected to an application of carbolic acid, was excised together with a liberal encroachment upon the adjacent tissues. The wound was closed excepting at the lower corner where a rubber dam drain was inserted. Healing was by first intention and on June 11, 1921, sixteen days after the operation, the patient left the hospital free from any pain and feeling well.

The pathologist's report of the tumor was alveolar sarcoma. Appreciating the virulent character of the neoplasm a "radium treatment" by a most competent radiographer was given June 3, 1921, and July 3, 1921. The total time for both radiations was 30 hours, 4500 mg. hours, 150 mg. of radium filtered with ½ mm. of silver, 1 mm. of brass, 1 mm. of lead and rubber at 2 cm. distance, were administered. These radiations were very painful for almost 60 hours after their application, and demanded the administration of an opiate for relief.

The patient's improvement was most encouraging. She appeared normal in every way, strength returned, she gained in weight, and her face reflected an ex-

pression of euphoria. Nevertheless the patient was kept under close surveillance and was subjected monthly to an examination. All went well, when on Oct. 22, an examination imparted to the examining finger a sense of thickening. This sense of thickening was apparent through the posterior rectal wall and in the vicinity of the former site of the neoplasm. The patient was not conscious of the existing condition, as she had not experienced any pain. Nothing was said to her. She was asked, however, to return in November for further observation. An examination on Nov. 25 removed all doubt about a recurrence vaguely entertained at the October examination. The thickening at that time too indefinite for a positive interpretation, had progressed so that a distinct infiltration of the tissues beyond the rectal wall could be readily recognized. Pressure too, now caused pain.

The patient was informed of the recurrence and before any advice could be offered, she requested an operation without delay.

The operation was performed at St. Luke's hospital Nov. 30, 1921, six months after the first operation. At the operation which was exceedingly severe, no encapsulated neoplasm was found. The tissues about the former site of the tumor presented a strongly infiltrated appearance. It was very difficult to judge the tissues during the progress of dissection. The points of limitation in the dissection were the tuber ischii. Before closing the wound a cautery at a dull heat was applied both to the soft and osseous tissues.

The patient reacted well from the operation. Healing progressed without infection and the patient was able to leave the hospital January 1, 1922.

During the patient's stay in the hospital she was given the treatment by the mixed toxins of erysipelas and Bacillus prodigiosus of Coley. The injections, given irregularly, were governed by the patient's condition. The reaction, i.e. chill, fever and depression following an injection were sometimes very severe,—even in the most minute dose (½ minim). An injection of 4 minims given Dec. 18 caused a very severe chill, a temperature of 104½° F. following. On Dec. 1, 1921, the first injection was given. On Dec. 24, 1921, an injection of 5 minims was given and no reaction followed. From that date on the injections were discontinued.

To give the patient the benefit of the advancement developed by the Coolidge tube treatment technic of deep radiation, the area harboring the neoplasm was exposed to these high voltage tubes from January 23, 1922 to March 14, 1922. The number of treatments given were 12, they were administered at an average of twice a week. The length of a treatment to the posterior rectal region was 75 to 150 milliampere minutes (75 milliamperes equal 15 minutes). The tube distance was 65 cm. and a current of 210,000 volts was utilized. An intermission from Feb. 10, 1922 to March 3, 1922 became imperative. The reactions were very severe. Pain was intense and nausea and vomiting frequently distressing. These constitutional symptoms usually continued for 72 hours and called for an opiate for relief. It was noted that the usual and expected increase in the resistance did not occur during the first four treatments. During an examination at patient's home Feb. 22, 1922 there was an apparent change in the affected area. To the touch per rectum the tissues felt hard, resistant and possessed of a peculiar elasticity; prior to the treatment they imparted a soft and doughy sensation. Although the patient was free from pain, slept well, had a good appetite, was gaining in weight, doing much of her house work, a suspicion that a dissemination of the pernicious tissue cells was active, could not be discountenanced. From March 3, 1922, to March 14, 1922, additional five treatments were administered, two of these treatments being anterior rectal.

The time and voltage of each treatment was the same as the preceding treatments. Similar reactions, perhaps in some instances more severe on account of the

weakened condition of the patient, were experienced as in the first series of deep therapy treatment.

March 3 further irradiation was discontinued in the hope that the patient's resistance would become greater and permit further treatments.

During the course of the deep irradiation treatment at five different times a hematoma appeared in the posterior rectal region which caused much pain by pressure. The hematoma was punctured and the blood which was almost black and liquid, showing not the slightest tendency to coagulate, was evacuated. The amount usually ranged from 200 to 400 c.c.

In connection with the high voltage therapy I may state that they were preceded by x-ray treatment while the patient was still in the hospital. The current from the hospital apparatus however, was only of 125,000 voltage. Four treatments of a half hour duration were given daily.

During the later period of the deep irradiation treatment a noticeable increase in the size of the involved area became apparent. A mass at the former site of the tumor could be easily outlined with the finger. The general condition of the patient began to show the polluted state of the blood. Appetite disappeared and she was compelled to take to her bed because of the sharp lancinating pains in her hips which radiated down the inner side of her thighs to the knees. Morphine in increasing doses and at more frequent intervals had to be administered.

On April 19 a distressing diarrhea following upon a constipated condition lasting six days, greatly weakened the patient. The diarrhea lasted until April 23 (five days) and was undoubtedly of toxic origin.

On April 21 urinary difficulties began to manifest themselves. The tumor had grown to such a size as to compress the urethra and the bladder. Catheterization became necessary.

By May 2 the tumor had encroached upon the upper portion of the rectum to such an extent that a large caliber rubber tube had to be introduced to allow the escape of gas and to drain off the liquid fecal matter.

Abdominal distention at times became so severe that the advisability of an artificial anus was seriously considered. However, as long as the patient could be kept from any great suffering by the administration of opiates, this surgical measure was kept only in expectancy.

The amount of morphine up to June 2 required by the patient to assure her comfort was from 8 to 10 grains in 24 hours. There were, however, nights when the pain in her hips and extremities was so severe that 2 grains of morphine hourly for six to eight hours became necessary.

On June 27 the tumor had attained a size that caused it to protrude through the vagina, giving the appearance of a child's head partially born. The labia were edematous. The rectal mucosa extended. Through the abdominal wall the mass could be outlined immediately below the umbilicus.

The clinical picture became one of abjection. Nausea, vomiting, colicky pains, neuralgic pains in the legs, genitalia and lumbar region racked the patient's tottering structure, which required large and frequent doses of morphine to benumb its sensibilities.

A ghastly cachexia had supplanted this patient's fair complexion and showed in affrightened contrast to the clearness of her intellect.

On July 4 great difficulty in passing the catheter was experienced. This was caused by the increasing growth of the tumor. To overcome any further difficulty I introduced my hand into the rectum and forcibly ruptured the structures confining the sarcomatous mass, thereby liberating a large quantity of liver colored substance. The evacuation of this mass gave the patient great relief. She fell into a sleep from which she was awakened by an attack of vomiting. The following

two days the patient's condition grew rapidly worse. It was clearly evident that some of Nature's defenses about the malignant growth had been destroyed. The temperature which usually ranged from 99.4 to 100.2 began to register 104.5 and 105, the pulse rate increased from 100 to 120 and 130, and the long looked for relief was in sight.

On July 7 at 4 A.M. the patient asked the nurse to turn her on her right side. While being turned she was suddenly seized with a sharp pain in the left side of her chest and expired.

COMMENT

Appreciating that a deep seated cancerous growth is a most dreaded malady, hopes were entertained in this case, though not seriously as far as a cure could be expected, that some favorable impress might be made upon the malignant lesion which would result beneficently to the patient.

These hopes were engendered by the great advancement made by physicists in the development of more powerful x-ray generating apparatus and a corresponding improvement in the therapy technic both with the roentgen ray and radium.

Furthermore, confidence was heightened by reports of a rather extensive series of successful results from large clinics. In this particular case when both radium therapy and the intensive deep roentgen therapy were carried out intelligently and assiduously by skilled members of the profession, this patient's life was destroyed within the allotted time given to these cancers even before the advent of radium or the x-ray. Neither can it be said that the suffering of the patient was palliated by these treatments, as was evident by the more frequent and increased doses of morphine demanded for relief.

What in the face of such an experience can be the cogitation of one who has given credence to much that has been said regarding some of the wonderful results in cancer lesions of radium and x-ray therapy?

There is only one deduction, that radium therapy and roentgen ray therapy are at present exciting an unwarranted enthusiasm in the treatment of deep-seated cancerous growths, and that the value of this treatment in the light of our present knowledge of cancer is being overestimated.

UNIVERSITY CLUB BUILDING.

DISCUSSION

DR. JAMES F. PERCY, SAN DIEGO, CALIFORNIA.—It is difficult for me to talk about cancer without alluding to my method of cautery heat in its treatment. As I see it the profession is not quite ready to accept this method at its full value. I cannot refrain from questioning if the outcome in this patient would not have been different if the mass had primarily been removed with the cautery knife, slowly dissected out as Dr. John Byrne dissected out a carcinomatous cervix in former days. Then when the growth was out he reapplied the heat to the tissue

surfaces that were left with his dome-shaped cautery tip until they were of the consistency of horn or of leather, in this way obtaining the maxium penetration of the heat. You cannot use the cold steel knife in the treatment of cancer without incurring the very great risk of further dissemination of the disease, and not only dissemination but stimulation as well.

We all know that in 35 per cent of the cases of carcinoma in the pelvis that die without treatment, complete postmortems show that the disease has remained absolutely within the pelvis. You cannot go into a mass of cancer in the pelvis or anywhere else in the body with the knife unfortified with heat without stimulating it into new virulence. This can easily be proved and has been proved over and over again in experimental cancer in laboratory animals.

I would like to ask Dr. Reder, whether there was any attempt to control the pain by caudal anesthesia?

DR. REDER.—No.

DR PERCY.—I have had two patients, both women, where metastasis developed in the pelvic bones following uterine carcinoma in one case and from a malignancy of the left breast in the other. These were last resort cases when I first saw them. This suffering was of the same atrocious type as that described by the essayist in his patient. Morphine will not relieve them, especially after the first two weeks. I know of one case where fifty grains of this drug a day gave no relief. Both of my patients were immensely relieved by caudal anesthesia with procain.

In carcinoma of the rectum, there is an increasing number of reports of cases where my first type of cautery is being used successfully. It is merely shoved into the rectal mass and sufficient current turned on to produce a gentle simmering sound heard when the ear is held near the instrument in the rectum. It is allowed to remain for an hour or even longer or until it is certain that heat penetration has been thoroughly attained in every part of the morbid growth.

Dr. W. H. Kiger of Los Angeles reported 25 cases of rectal carcinoma, treated by my technic, at the St. Louis meeting of the American Proctological Society in June. He has practically abandoned all surgical methods in the treatment of rectal cancer for that by the local diffusion of heat. His successful results have been most gratifying and even remarkable.

Last May I received a very enthusiastic letter from Dr. Edward Martin of Philadelphia reporting that one of his private patients, on whom he had used my cautery for rectal cancer seven years ago, is not only alive and well but also free from all evidence of cancer.

In the surgical treatment of cancer we must eliminate the positive danger from dissemination and stimulation of the cell growth, and this can positively be accomplished by our substituting the hot for the cold knife.

DR. W. WAYNE BABCOCK, PHILADELPHIA, PENNSYLVANIA.—It seems to me, we are not getting very far in our concept of the treatment of malignant disease until we carefully differentiate reactions of the various sarcoma and carcinoma to treatment. The first case of Dr. Reder was one of sarcoma, and a peculiar type of sarcoma growing in the pelvis. Sarcoma in general presents an entirely different therapeutic problem from carcinoma, although carcinomas have protean manifestations and types of malignancy. Against the more malignant type of sarcoma I know of no treatment that is effectual. Let us take, for instance, certain malignant periosteal sarcomas of long bones, where a cure from even high amputation is practically unknown. The few cases that have lived for more than a year or two years have been cases, for the most part, where there was some question as to the diagnosis. On the other hand, giant cell sarcomas or myeloma of bone are relatively benign. They recover after thorough excision or x-ray treatment. It is an en-

tirely different proposition as against some of the malignant tumors where operation seems to determine where the return will take place.

I recall a case of carcinoma of the hand where amputation was done at the wrist, and the growth metastasized in the stump. Amputation of the shoulder was done and the tumor reappeared in the scar. Then, after an interscapular thoracic amputation was done, metastasis occurred on the chest wall. In other words, wherever the knife had made its impress and had produced traumatism the tumor came back.

Let us take the case of melanotic sarcoma, or melanoepithelioma, if you do not wish to call them sarcoma. I wonder if any of you can recall a case where excision or other treatment of such a growth has been followed by an ultimate cure. I do not. Too often operation seems to cause the growth to flare up and to grow rapidly. With carcinoma we have a different problem to deal with, and I wonder if I understood Dr. Percy correctly when he said that operation only produced stimulation. In carcinoma of the lip or where the growth is not larger than a pea, free excision according to Bloodgood, gives 100 per cent of cures. With an advanced carcinoma of the lip, an extensive block dissection, cauterization, x-ray and radium are all usually ineffective.

As to growths in other parts of the body, the results from hysterectomy for carcinoma of the body of the uterus are probably not excelled by methods now in use, while radium has largely displaced hysterectomy for cancer of the cervix, some cases will do best if we let them alone. I think somebody should classify the various malignant growths in relation to the type of patient in which the growth develops, for whether the patient is fat or lean, old or young, also has a great influence on the progress of the disease.

DR. WILLIAM SEAMAN BAINBRIDGE, NEW YORK CITY.—Dr. Babcock has given an impressionistic picture of our absolute ignorance in regard to the essential cause of cancer, including sarcoma. While agreeing in the main with his discussion, I may say that my experience in relation to melanotic sarcoma is not in conformity with his. Melanotic sarcoma is indeed a very fatal form of the disease, but there are cases that have been cured. The following two illustrative cases are on file in my office, and I give them to you here so that they may be put on record in this connection: 1. O. L., male, fifty-seven years of age, married. February 29, 1912, this patient was operated upon, in another city, for a melanotic sarcoma of the neck.

Two months later recurrence took place and in May, 1912, I removed a large melanotic sarcoma, adherent to the jugular vein and carotid artery, ligating the jugular vein.

The patient was discharged June 6, 1912, and a letter from him, dated September, 1922, states "that he is in the best of health and has had no return of the disease."

2. J. M., female, thirty-five years of age, single. This patient had, at birth, a small papilloma on each wrist. These remained the same size until she was 32 years old when the papilloma on the right wrist began to increase in size until it was as large as a silver quarter. It was melanotic in character, with scabs, and bled easily.

April 17, 1915, the growths were removed and proved to be melanotic sarcoma. The patient recovered from the operation and to date, (September, 1922) there has been no recurrence of the condition.

In a private communication recently received from Dr. Rufus B. Hall, he cites a case of a woman, 30 years of age, married, with 1 child 13 months old. At birth she had a slightly elevated black mole one fourth inch in diameter on the chest wall to the right of the sternum. The mole gradually enlarged and at the time

of her marriage was about 1 inch in diameter and elevated about one fourth inch. A few days before her confinement in June, 1908, it became inflamed, enlarged, and discharged an exudate. Operation was performed forty hours after birth of child; there was a large open ulcer involving about one fourth the surface of the growth. Pathologic report: ''Melanotic sarcoma.'' There has been no recurrence and the patient is apparently in good health at the present time.

In regard to the spreading of malignant disease by operation, this is true in some cases. But is not a great deal of the untoward result in the use of the knife accounted for by the lack of recognition and practice of the lessons of Ordway and Tyzzer? Tyzzer states that ''every physician should realize the irreparable harm which may result from the manipulation of malignant tumors in their early development. * * * * * The palpation of the mass in question in repeated physical examinations, the violent scrubbing often employed in preparing the field of operation, is almost identical with that which I have employed for the experimental production of metastases.''

DR. REDER (closing.)—We had hopes when we received this high voltage apparatus from abroad that we were in a position to do much good for this patient. This woman displayed great courage while undergoing these treatments. Death came within the allotted time for such growths. She was subjected to the scalpel, to radium, and to x-rays. It was the knife that gave the greatest relief.

Dr. E. Gustav Zinke

THE LIFE OF DR. E. GUSTAV ZINKE

By Dr. C. L. Bonifield, Cincinnati, Ohio

IN 1870, a Prussian man of war anchored in the harbor of New York on a friendly visit. Among those on board was a young man who had served eight years with the navy. He had become weary of the service and regarded America as the land, not only of freedom, but of opportunity. Therefore when on shore leave from his vessel he changed his naval uniform for a cheap suit of civilian clothes and hastily made his way to Illinois. Here he worked for a time as an ordinary farm hand, but later secured employment as a school teacher.

In the spring of 1875 he received the degee of M.D. from the old Medical College of Ohio in Cincinnati. Such was the early life of Dr. E. G. Zinke, as far as it is known to the writer.

The faculty of the Medical College of Ohio at that time numbered among its members five men of unusual ability, force of character, and reputation. These were Doctors W. W. Seeley, Robert Bartholow, James T. Whittaker, P. S. Conner, and Thad. A. Reamy. This group of men had much influence on the future life of Dr. Zinke.

In 1876, the year after his graduation, he became an assistant to Dr. Seeley, who was Professor of Ophthalmology, and worked in that department of the college until 1879, when he gave up that position and became an assistant to the chair of Gynecology. He was occupying this position when the writer graduated from the same institution in 1886.

His appearance, at that time, was very different from that familiar to all the members of this society. He wore his hair pompadour and had a long flowing beard, both hair and beard receiving very careful and frequent attention. He spoke English with a very broad German accent. It was even difficult to understand.

It was five years later, when the writer was admitted to membership in the Cincinnati Obstetrical Society, that he became well acquainted with Dr. Zinke and learned to admire his sterling qualities, and formed bonds of friendship with him that were only severed by death.

In 1896, he became Professor of Obstetrics and Clinical Midwifery in his Alma Mater, a goal for which he had striven industriously from the time he had dropped Ophthalmology. He occupied this position for ten years. His lectures were always thoroughly prepared and his efforts were appreciated by the students and faculty of the college.

He developed an outdoor Obstetrical Department at the expense of much time and labor, which was one of the best in the United States.

He was popular with medical students, not only on account of his

teaching ability, but also because of his keen interest in their general welfare.

He was a member of the Nu Sigma Nu fraternity and took great interest in the activities of the local chapter.

As a practitioner of surgery and obstetrics, Dr. Zinke was conservative but not cowardly, energetic but not meddlesome. He never neglected a patient. As a consultant, he was kind and courteous, firm and determined. As a writer, he was accurate and very careful in his use of English.

Dr. Zinke's worth was appreciated by his fellow practitioners in Cincinnati. He had been President of the Cincinnati Obstetrical Society and President of the Academy of Medicine. He was a member of the Board of Health at the time of his death. He also had been chairman of the section of Obstetrics and Gynecology of the American Medical Association.

The Deaconess Hospital owes its existence largely to his efforts. For many years he was its chief of staff and Obstetrician and Gynecologist. Though often having patients in other institutions it was here that the larger amount of his work was done.

Early in his career, Dr. Zinke married Miss Clara Von Seggern of Cincinnati, and that their married life was exceedingly happy need not be told to any of the members of this society who are in regular attendance at the meetings. I have rarely seen a man so dependent upon his wife for the little details of his daily life. They had two children, Dr. Stanley Zinke and Mrs. Dr. Wm. Muehlburg. Dr. Muehlburg is the Medical Director of the Union Central Life Insurance Company. Dr. Zinke was a fond and indulgent parent.

Mrs. Zinke died in December. Her death was a terrible blow to the Doctor, from which he never recovered.

On Jan. 16 he started to Florida, accompanied by a friend. He reached there in safety and when night came he retired to his bed to rest, to sleep, never to awaken.

Dr. Zinke had lived longer than the time allotted by the Psalmist and his life was well spent. In the words of Ingersoll,—"Life is a narrow vale between the cold and barren peaks of two eternities. We strive in vain to look beyond the heights. We cry aloud, and the only answer is the echo of our wailing cry. From the voiceless lips of the unreplying dead, there comes no word; but in the night of death hope sees a star, and listening love can hear the rustle of the wing."

In the light of this star of hope, may we not envisage our friend and fellow, attended by his faithful wife, in the Elysian fields in company with the little group of men who taught him his first lessons in the art and science of medicine, and who inspired him with those lofty ideals which were always his guide in the practice of his profession.

In Memoriam

E. GUSTAV ZINKE, M.D.

An Appreciation by Herman E. Hayd, M.D., Buffalo, N. Y.

On March 14, 1911, Dr. William Warren Potter, who had been the secretary of this Association from its inception and one of its founders, lived and died in the city of Buffalo. At our Syracuse meeting, September, 1910, I was elected president and living as I do in Buffalo, I had easy access to the records of our Association, through Dr. Potter's office assistant. Therefore I was able to carry on the work of the deceased secretary, edit and get out the transactions and provide the program and papers for the Louisville meeting in 1911, when Dr. Zinke was elected secretary and I was made treasurer to succeed Dr. Werder, who resigned the office. It required much persuasion on the part of myself and many other members of the Society to induce Dr. Zinke to take the office. However, he accepted it temporarily and in the hope that a more willing member would be agreed upon at our next meeting.

The duties of the office soon became interesting and attractive to him and at the following meeting, he was satisfied to succeed himself and soon he became an ideal secretary, because of his pleasing and affable manner, his gracious and cheery disposition, his splendid mind and scholarly qualifications and his orderly habits and temperament; and as a natural sequence, he became a permanent fixture and for ten years continued as our secretary.

You were good enough to place me in office with him and although my duties were few and simple as compared with his, which were exacting and often laborious, we worked together with pleasure and satisfaction and there existed, to the time of his death, the deepest love and friendship and affection between us.

In any corporation or large business its success depends upon the executive head and Dr. Zinke certainly was our leader and he gave the Society the best there was in him and the ideals and hopes of our founders were ever present with him and our transactions and annual meetings were his sole ambition and his hopes for better work in our chosen specialty stimulated him every year, to have our members provide more scientific and scholarly papers and more valuable discus-

sions, so that our growth and development would reflect honor to us all.

He became a member of this Society in 1900, and his first paper, "Is Cesarean Section Justifiable in the Treatment of Placenta Previa," appeared in the 1901 transactions and was an epoch making contribution, and has been quoted and commented upon by many writers and abstracted in foreign journals, and I believe, stands today as the best contribution to that important condition. Another paper of very great importance was on, "The Limitations of Cesarean Section," which appeared in our 1903 transactions; and each succeeding year, he discussed some obstetrical problem with the authority of the master, and soon made himself felt in the Association, as one of its biggest men and became recognized as one of the leading obstetricians in America. He was honored by the presidency of our Association in 1907 and wrote other valuable papers on midwifery subjects, and perhaps none has caused more discussion and even bitter controversy, than that on eclampsia, in which he extolled the virtues of veratrum viridi, and up to the time of his death, he believed it to be the remedy "par excellence" in the treatment of this condition.

It is needless for me to make any further references to his scientific attainments, as most of you have listened to and read his papers for many years and always were moved and impressed by his judicial and conclusive arguments when discussing any subject before the Society.

I saw much of him, socially, as he and his wife visited me frequently, at my home, and I can heartily attest to his many virtues. In Mrs. Zinke, his wife, he always had a loving companion and one on whom he leaned and depended, as a child. She died a few weeks before him and his grief was so overwhelming that he broke down. He went South with friends in the hope that the change might lessen his despair, and while visiting in Palm Beach, was found one morning dead in bed. His death was, no doubt, caused by a broken heart. He was a noble man, a devoted husband, a loving father and a splendid citizen.

In Memoriam

E. GUSTAV ZINKE

Selected by Dr. H. W. Yates, Detroit, Mich.

He is not dead I know, for death implies
Oblivion, and He who fashioned him
In His own likeness made him immortal,
Part of the everlasting plan of things,
Sublimely drawn to guide the universe
By that Creative Power we hold as God.

He is not dead, because the friend I knew
Was not material which must return
At last into its native nothingness.
He was the child of Truth, reflecting Life
Eternally of Love which cannot die.

E'en mortal sense gives proof my friend still lives,
Mine eyes behold the wonders he has wrought,
An instrument of Truth's unbounded power
Still reads his message to the coming years,
Replete with knowledge of the Truth he sought.
Mine ears still hear the music of his voice
In kindly counsel when my need was great,
Still hear the friendly tones that marked him well
As comrade, friend and brother to his kind.
My hands still tingle with the hearty clasp
He always proffered to his fellowmen,
Still thrill with pleasure of that kindly touch
Of loving friendship when we parted last.

He is not dead, he lives in Truth beyond
The seeming limit of our mortal eyes,
And knows the measure of our destined way
Is not to die but live in Spirit's realm.
He lives! My friend still lives! The good he wrought
Is mine to follow, mine to enjoy.
The path he blazed on earth is mine to tread;
To walk therein and know that righteous work
Will bring success in all that stands for Good.

To live aright! Give me that power, Oh God!
To prove my worth to meet again, my friend.

Dr. Bernhard Sigmund Schultze-Jena

In Memoriam

PROFESSOR DR. BERNHARD SIGMUND SCHULTZE-JENA

By James E. Davis, A.M., M.D.

FOR thirty years, (1889-1919), our Association has been honored by the distinguished name of the nestor of German Gynecology, Prof. Schultze-Jena, whom we must now enter with our deceased Honorary Fellows. His demise occurred April 17, 1919. He had frequently informed his son, Dr. Kurt Sigmund Schultze-Jena of Weimar, concerning his pride in being an Honorary Member in this society and of his regret in being unable to accept repeated invitations to visit America.

In Geburtshülfe und Gynäkologie, Band XLIX, Heft 6, 1919, edited by A. Martin, F. Schauta and A. Doderlein is published a résumé of the life, labors and scientific contributions of our distinguished colleague and Corresponding Honorary Fellow.

A long life and wonderful ability for scientific labor characterized this sturdy German, but more than this, his intellect was brilliant. He was a distinguished thinker and his on-strivings were characterized by vivacity of interest. From his friend and intimate colleague, Prof. A. Martin, a distinguished Honorary Fellow of this Association, we have a tender and beautiful tribute—that Schultze-Jena was a spirit ever fresh and deep in his understanding of the development of woman's disease, and untiring in his pursuit of newer knowledge. He was like a father in his understanding of the younger generation of his associates. Their faults were not passed with scorn but with helpful criticism.

His contributions in writings began in 1851 at Greifswald with the "Diss.-Inaug.," and concluded with a paper in Centr. f. Gyn., 1919, No. 15, upon the Injection of Blood in the Umbilical Vein in Adherent Placenta.

N.B. The Association is indebted to Prof. Kurt Sigmund Schultze-Jena, Member German Society of Surgery, and son for a reprint from Geburtshülfe und Gynäkologie and the photo here used.

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